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AUGUST 1950

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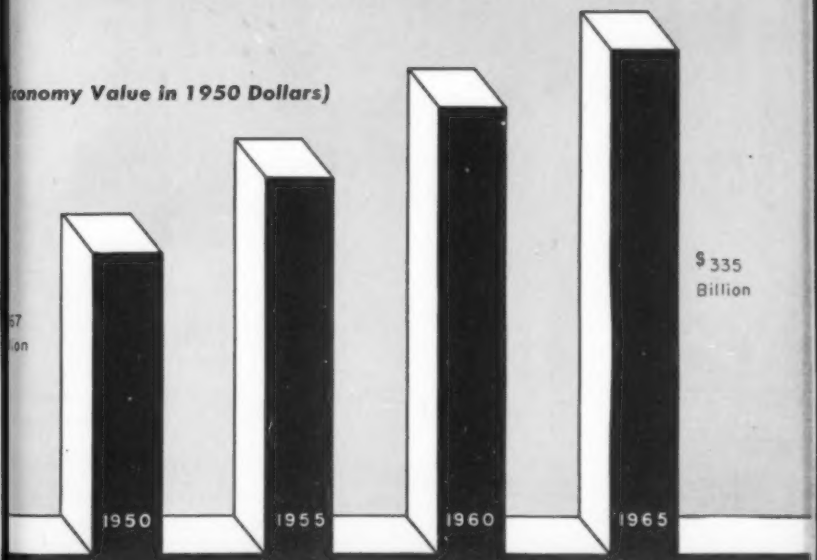
. S. Economy Growth Brightens utlook for World Business—p17



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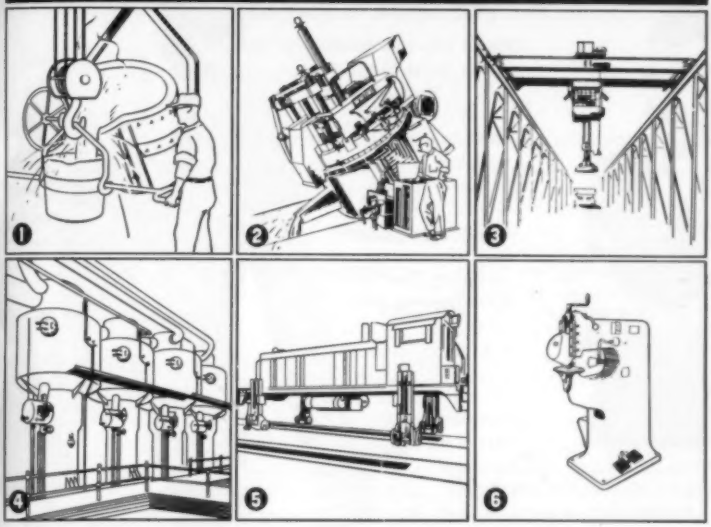

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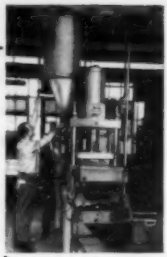

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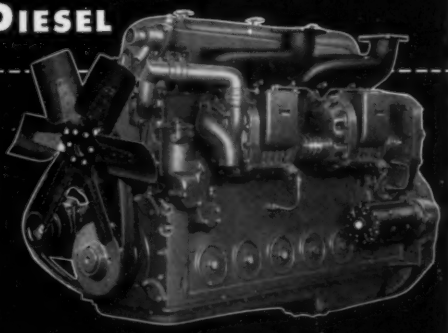

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Business Trends

FREE CONVERTIBILITY of major currencies will come within a year. That is what Washington officials forecast privately. Convertibility will come, they say, if the current U. S. boom continues and if recovery abroad is sustained. The European Payments Union, it is hoped, will permit an orderly rearrangement of Europe's currencies and will be a stepping stone to full convertibility.

U. S. prosperity is the key to convertibility. A small decline in economic activity here would mean a large decline in imports. And a decline in U. S. imports would arrest world recovery, put an end to hopes for convertibility.

Will the present U. S. boom continue? On housing and automobiles depends the current prosperity. Housing is running 50% ahead of the record 1949 construction. But prices are climbing, might arrest new construction in 1951. Automobiles are being produced 50% faster than a year ago. June output reached an annual rate of 10-million units. Some slowdown in early 1951 is probable.

No violent depression—that is the forecast, even if private housing and automobile production slow down. The government has a big housing program in case private construction declines. Rising output in other key industries will cushion the shock of declining automobile production. Paper production, textiles, chemicals are rapidly expanding. So 1951 will probably bring only a mild readjustment, if any.

U. S. economy is now more stable than in 1929. No disastrous credit curtailment, which in 1929 led to liquidation and panic, can now take place. The credit system is no longer based on private loans, which could be called at any time, but on loans to government which can never be called. The mortgage system, once a great source of instability, is now thoroughly revamped. Speculation, which touched off many a panic, is rigidly controlled.

The government budget of over $46-billion provides a floor under the national income. Finally, the government now has the power and means to intervene at first signs of economic decline. So although a minor readjustment in 1951 is possible, no major depression is likely in the foreseeable future.

LOWER GOLD PRICES signal returning confidence in "soft" currencies. Hoarding of gold by French nationals has virtually ceased. Some privately held gold is being sold for francs at a premium of only a few dollars above the official price of $35 per oz. This will permit the French treasury to replenish gold reserves and strengthen the franc. French observers say that budget deficits have to be wiped out to restore full confidence and permit convertibility.

Russian speculation is not responsible for gold price drop, contrary to rumors current here and abroad. Developments in France and in the far East account

Business Trends (Continued)

fully for the spectacular decline in recent months. With the tightening of Communist control over China, the Chinese demand for gold has ceased. And sales by refugees have augmented the supply of gold and forced prices down.

South Africa is hurt by gold price decline. A substantial portion of South African gold was sold on the free market, helped earn much needed foreign exchange. Now many minor mines are forced to shut down. But South Africa will have a new source of dollars: a direct Swiss investment of $11.2-million will help develop seven gold mines in Orange Free State.

U. S. SHIPPING HAS BEEN HURT by foreign competition. While world's shipping is growing, the U. S.'s share is constantly declining. Laid-up ships and rampant Maritime Union unemployment are becoming serious problems. Main reasons for U. S.'s plight: high wages and lack of an efficient subsidy system.

New Maritime Board brings hope of a more efficient subsidy system and higher, more equitable subsidies. But no immediate effects are to be expected, as subsidies have to be authorized by Congress.

POINT FOUR is fast becoming a reality. Conducted with limited funds—some $25-million is to be spent initially—it includes a wide variety of activities. Here are some important developments:

Resident experts have been appointed to supervise and coordinate the large number of projects planned for Pakistan and Haiti.

Technical teams have left for Bolivia and Afghanistan to advise the governments on broad economic problems. Special experts are to visit and advise a large number of Latin American and Asiatic countries.

Latin American students will receive technical training in Puerto Rico. A sum of $1½-million has been set aside for the project; 100 students will receive training this year and 450 ultimately.

EGYPTIAN DEVELOPMENT plans call for attraction of foreign capital and technical assistance. Under an ambitious 5-year plan, Egypt wants to:

- **Develop a scheme** for chemical plants and steel works at Aswan.
- **Improve the communication network,** including railways, highways, airways, and telecommunication. New pipelines are also contemplated.
- **Modernize the port facilities,** create free zones.
- **Expand and modernize existing industries,** especially the textile industry for the multi-million project.

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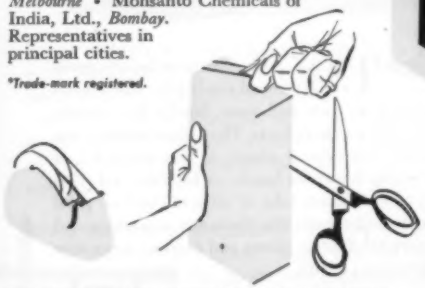

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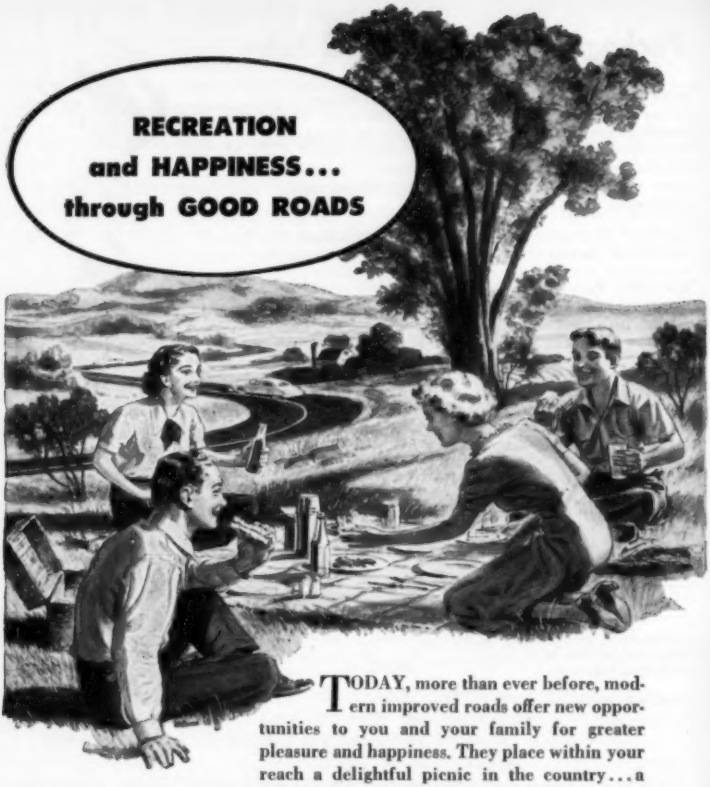

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Washington Report

FORCE TO ENFORCE THE PEACE—that's the situation in Korea as we go to press. Couple that force with talk of strong secret weapons and you see a new U. S. foreign policy emerging from its past of indecision and wishful waiting.

New weapons talk coming out of Washington is to build morale. The talk is official and is designed for consumption by three audiences:

Western Europe—Defense planners are eager to show Western Europe it can defend itself without going broke or being depopulated in the process. They are saying new strategy will call for far fewer divisions than was generally thought. So France, for one, need not worry about providing a mass army.

Russia—New weapons give defense the edge on offense; so says the military. Our new anti-tank guns may make the tank obsolete in a few years. Detailing how we propose to defend Western Europe, officials figure, will prevent Stalin from making any miscalculations. And Washington, still regarding the men of the Kremlin as realists, believes they will not choose war.

Congress—Defense chiefs are using freely the word "cheap" in talking about new weapons. They will not be cheap in the developmental stage, of course. But maintaining a small, technical army will be cheaper in the long run than supporting the mass armies of the past.

Military chiefs are talking about their plans before most of them are on paper. Western Europeans will not be seeing any new weapons for a couple of years. And they will not see them in volume until after that. U. S. defense spending will not go up sharply. The administration just cannot stand that politically in this election year.

But officials believe the people of the western world must have a goal to work for—something to erase the defeatist attitude in Western Europe, something to make it easier for Congress to pass foreign-policy legislation. Coupled with the amazing economic recovery in Western Europe and the new life given to the Atlantic Pact at London last May, the new-weapons talk is designed to do the trick. But remember, Hitler used secret-weapon talk too. It never worked for him.

ECA'S ROVING AMBASSADOR, Averill Harriman, will become special assistant to the President in August. Right now 46 major government departments and agencies influence the formation of foreign policy. Inter-departmental disputes are largely responsible for the lack of direction that U. S. policy appears to have abroad. Harriman's job will be to reconcile conflicting opinions before they make headlines around the world.

The dollar-gap problem will fall to Harriman when Gordon Grey leaves the administration in the fall. About all Grey will be able to do is to state the

Washington Report (Continued)

problem as official Washington sees it. Keeping the world supplied with dollars will be Harriman's big job.

EXPORT-IMPORT BANK LOAN TO SPAIN will probably be announced by the end of the year. By that time a new U. S. ambassador will be in Madrid.

Franco has applied to Ex-Im Bank for an $800,000 fertilizer loan. But probably that is only part of the story. Spain needs power development badly. When Franco is back on the list of loan customers at Ex-Im Bank, new money from private channels, particularly for cotton, is sure to come.

U. S. AID PROGRAM FOR THE PHILIPPINES is beginning to take shape. State Dept. may ask Congress to vote it next session.

Philippine trade and finances are in a bad state. For 20 years before the war, the islands enjoyed a favorable trade balance. Since 1945, there have been some huge deficits. Last year the new republic's exports topped its imports by $300-million. At the same time, internal spending has built up a budget deficit that promises to hit 450-million pesos ($225-million) next year.

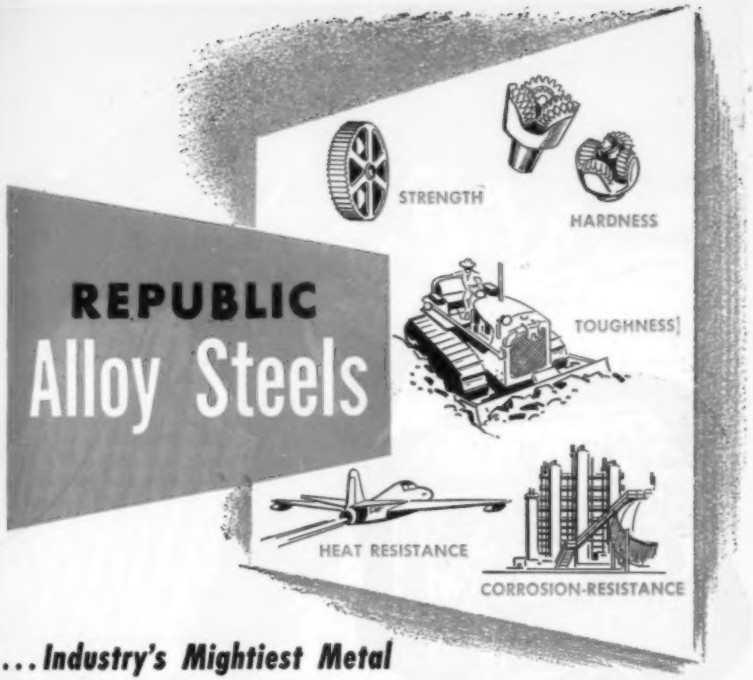
An economic survey mission, sponsored by the State Dept. but manned by experts outside the government, is now in the islands. Object is to tell President Quirino what he must do to put his house in order. If Quirino takes the mission's advice, he stands a good chance of getting more help from the U. S. Since the war, U. S. payments to the Philippines, including army spending, have amounted to almost $2-billion.

Washington figures the Philippines are headed for serious trouble in about 2 years unless action is taken now. The republic is developing the symptoms of the disease that finished nationalist China—runaway inflation, corruption in government circles, and growing popular support for the communist-led "Huk" guerillas. This time, though, the U. S. will not sit by.

HOW BEST TO KILL THE ITO CHARTER has administration planners puzzled. They all agree that the charter has no chance this year, and probably it has none next year either.

One group wants a vote now, even if it is a rejection. A decision would at least free the State Dept. to try new ways of getting its principles of world trade accepted. Another year of no action, this group feels, would cost the U. S. any chance of setting world trade policy on its own terms.

Another group thinks the charter should be quietly shelved for good. That would remove the embarrassment of having Congress turn down a world program, drawn up, for the most part, by the U. S.



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August 1950 • McGraw-Hill DIGEST • Volume 5 Number 8

U.S. Economy Growth Brightens Outlook for World Business

Expanding American economy will result in considerably better business throughout the world and particularly improved business in some fields

By 1965 the American economy will be producing $335-billion of goods and services (gross national product) per year —nearly a third more than in 1950. That is the estimate of the McGraw-Hill Dept. of Economics, based on the assumption of no war within that period and close to full employment.

This estimate is a conservative evaluation of the growth potential (in 1950 dollars) from the present gross national product of about $267-billion.

But what does this mean to the overseas businessman who looks to the U. S. as a market for his goods? And where in the growth of the American economy can he direct his sales effort and be sure that he will meet an expanding market?

What Governs the Economy

Let's look at a few factors that will govern the economy. Population growth will be a key force in expanding the gross national product. High employment, rising wages, more security programs—all will combine to raise economic standards and therefore marriage and birth rates. Advanced medical science, of course, is contributing to greater longevity.

By 1965, this American market should increase from its present 150-million people to 170-million or more. This population growth will mean more people to buy more goods, to demand more services.

A second governing force working to increase the gross national product is rising productivity. New machines, new methods, and more power in the hands of the workers will multiply their efforts in the future even more so than in the past. General Motors Corp., for one, is depending on a continuous rise in the productivity gain to meet the terms of its recent union agreement.

Productivity Gain—1.7%

To reach a $335-billion gross national product, productivity should rise about 1.7% yearly and 4½-million workers should be added to the labor force. The Federal Reserve Board (FRB) production index should then rise from its 1950 value of about 180 to nearly 240 in 15 years.

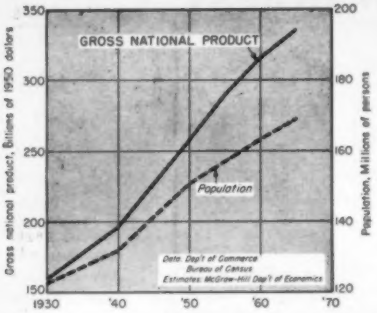
But where do you, as a world businessman, look for your direct markets? Here is a leading answer. According to *Electrical World* magazine (May 22, p101), the industries that are the largest users of electric power have particularly bright growth prospects.

Production in the five major power-consuming industries—steel, paper, nonferrous metals, chemicals, and petroleum and coal products—is estimated as 17% higher for 1955 than in 1950. By 1960 the gain should reach 38%, and by 1965 it should go to as high as 57%.

Chemical Industry Growth

The chemical industry promises remarkable progress and probably will show greater gains than will any other comparable field. Assuming a general industrial growth from 180 to 240 (FRB index), the chemical industry may jump to double the figure of its present output.

For the oil industry too, the future is bright. A 50% gain over its 1950 production rate is likely. This industry also will



feel the weight of chemical developments, especially in output of petrochemicals and the usual refinery products.

While steel, paper, and most nonferrous metals are expected to follow generally the over-all index of production, the light metals show greater growth prospects. These prospects are not too easily evaluated at present.

Housing Means Business

Another magic word—housing. New housing means furniture, textiles, appliances, and all the things that make a house a place to live. It means services too—electrical power, for instance, and the generators behind the power line.

Right at this moment, the new housing pace in America is terrific—meeting a pent-up demand. It cannot last, but let's look at the long-term trend.

Population growth must mean housing. In 1965 the total number of occupied units should be at least 5-million more than now. The major gain, once the present demand is met, will come in the 1960's.

From now up to 1955, units occupied should go up by 2-million, from 1955-60 by a million, and then by another 2-million in 1960-65. The low birth rate in the 1930's will show up in the slackened demand in the 5 years from 1955-60 as fewer new families are formed.

For one more pointer on where to look for markets, follow the population trend. Some areas will show greater expanding demand than will other areas. At present, the center of U.S. population is moving southward and westward. The Far West is showing the greatest population increases and will continue to do so. Estimated: 13% more people on the Pacific Coast in 1965 than in 1950.

Consumer Demand

You should watch closely too the pattern of consumer demand. People will be spending less of their income on the basic items because most families have risen from the substandard existence of the 1930's.

But necessities, like food and clothing, will not change in importance. They will continue to demand the bulk of the disposable income—say, $150-billion of the estimated $250-billion for 1965.

The proportion going to home furnishings, automobiles, travel, recreation should increase. Shorter working hours and more leisure time will create more demand for pleasure items. They should create more demand too for the luxury items that, to such a large extent, are supplied to the American people by the fine craftsmen from abroad.

Good Business Signs

So in looking to America for markets, watch these things in the American economy: employment trends, rate of wage increases, birth rates, productivity, population growth and shift, changing consumer living conditions and demand, and more specifically the trends in the major industries. This last is of prime importance if you are a producer of industrial goods or raw materials.

But while watching these phases of the American economy, judge too the effects of any change in national and international policies on the growth prospects. Present policies are geared to steady growth and a long general upward trend.

How Product Design Cuts Cost

Your money will go further and production can be increased with a design based on cost analysis, standardization, and the right materials

A COST-ANALYSIS GROUP in the engineering department is the answer to a more economical product design and more profit in highly competitive markets. The group is specifically charged with investigating production costs and directing design toward economical production. This service function can counteract high manufacturing costs—and it will pay for itself!

Five years ago, a leading manufacturing concern in the U. S. started its cost-analysis group. During one year of operation, the six-man group achieved a potential savings of more than $1½-million.

Some of the detailed cost studies made covered the cost of welded versus machined assemblies and relative costs of bolting, spot welding, and riveting. Secondary savings probably equalled, if not exceeded, the direct savings.

The cost-analysis group can also determine cost estimates when making proposals or bids. A well organized department will reduce the time and detail of estimating to give a rock bottom competitive figure.

Development Costs

Another reason for cost analysis is to establish directions and objectives with reference to costs in design developments. It would be futile to add sales value to a product if the increase in manufacturing cost were greater than expected profits.

Relative cost estimates do not in themselves assure that another design will not be cheaper. Comparative estimates help select the most economical design from those proposed.

Tool costs can be considered first after the final detailed and parts drawings have been approved. They include estimated engineering and layout time, machining, and materials costs. Time to make the tool, finishing, and heat treatment are basic considerations. Cost of auxiliary tools also should be included.

Setup time for a production machine and an accurate estimate of the number of parts to be produced within a given time are imperative. Tool life and probable breakage in service, plus maintenance costs, are necessary estimates to arrive at a practical amortization figure.

Material and Inspection

The actual weight of the material plus an allowance for scrap and defective parts will determine the material cost on a piece basis. If part dimensions are critical and inspection must be 100%, time and cost of inspection should be included.

Final parts may be bolted together or fastened by quick-acting snap or screw fasteners. They may be welded, riveted, or brazed. The product may be simple, like a brazed heat exchanger, or it may be extremely involved, like a machine tool. Testing and final inspection, as well as overhead costs, must be added to the total cost.

Finishing coats, such as paint, may be a determining factor in selecting a production method. Stamped or brazed parts may have to be finished while plastic parts may not.

Packaging cost is based on the type of container used, whether one or more parts can be packed in one container, and on type and quality of other materials used. Damage in shipment should be taken into account as claims against a carrier require considerable checking and bookkeeping.

If all these cost factors were considered during the design stage, engineering

would be on a sounder basis to recommend production methods for articles under development.

Beware of Intangibles

Aside from the direct costs of manufacture, there are a few intangible costs that are often overlooked. One is the cost of handling and storing heavy and bulky items.

Large casings require many times the cost of handling a comparative dollar value of small expensive parts, such as ball bearings. An exact analysis will reveal that the high-priced lightweight items are charged more than their share of the actual costs of purchasing and storing.

Another intangible is that new designs require that a print of each part be sent to an established list of individuals. Investigation of this list by one company revealed that many of these persons could get along without prints. The company saved $30,000 in 1 year by deleting these people from the list.

Design standardization and simplification will not only reduce the total cost of the final product but will also cut down handling, purchasing, and printing costs. Simplifying may permit component parts to be purchased complete instead of made in the plant. The saving may not be apparent until the actual cost of purchasing, handling, storing, inventory, insurance, and similar factors are investigated. These costs can exceed any apparent difference in price.

Fewer Parts Save Money

Stocking fewer different parts also permits a saving by purchasing in larger lots, especially when standardization covers a number of sizes and models. These factors can justify the cost of an extensive redesign program.

Changing a heavy casting in one shop from iron to aluminum did away with hoists and helpers to set the pieces in the machines. Savings amounted to several times the difference in metal cost.

Shipping cost is another item usually forgotten. The real cost of a product must include the cost to have it delivered.

With production machinery the greater output resulting from an improvement can be evaluated in dollars and cents. Widely varying values include quieter operation, added safety features, easier handling, smaller size, lighter weight, and many other items.

Correct design should be the final design. Changes after manufacture has begun are often costly. The largest cost is usually that of teaching the shop personnel to manufacture and assemble the new product. A complete cost analysis during the original design can help to produce a simple design that will fulfill the required sales value and reduce the number of changes.

Material Selection Problem

Just as the designer must periodically reevaluate his product to make it more attractive, more serviceable, and less costly to build, he must also reanalyze the materials of which it is made. The primary factors in selecting new material may be grouped as: suitability, availability, cost. A suitable material must be capable of withstanding the conditions of temperature, corrosion, loading, and aging that it may face during shipment, installation, maintenance, idleness, and sage. Material properties that may dictate a choice include corrosion resistance, strength or hardness at high or low temperature, and wear resistance.

Choice of material may vary from plant to plant, depending on manufacturing facilities and availability of skilled labor. It must also be capable of being finished into an attractive product.

Material should be supplied from at least two different sources to reduce the hazard of unforeseeable difficulties at the supplier's plant. A great variety of material has been made available in the last few years and substitutions are no longer necessary.

Cost of materials, especially mill prod-

Here is one example of material improvements

Improvements in refrigerator motors over the past 20 years. The decrease in size and increase in rating was made possible largely by better insulation. Note improvements also made in mechanical construction: 1930, riveted; 1940, spun shroud; 1949, argon arc welded.

	1930	1940	1949
Weight of iron, lb	7.20	6.13	3.96
Weight of copper, lb	2.10	2.00	1.81
Weight of insulation, lb	0.70	0.47	0.27
Total weight, lb	10.0	8.60	6.04
Stack height, in.	2.0	1.5	1.0
Rotor weight, lb	5.0	3.8	2.78
Output, watts	180-200	220	240

ucts, is comprised of a base price plus extras for non-standard close tolerances, out-of-size dimensions, special quality or treatment, and below-normal quantity. Such extras should be "designed-around" where possible.

Processing may decide which material to use. Common comparisons are between castings and brazed or welded stamped assemblies. A job shop is restricted to flexible equipment, and sizes of material must be limited to this machinery. Special tooling is only justified for mass production.

Why Change Material?

Frequent cause to change materials is the ever present effort by a company to develop and to improve its products. Silicon core steels are responsible for an outstanding savings in the transformer business because the high electrical resistivity obtained decreases eddy-current losses. Core steels possessing a high degree of crystal orientation in the direction of magnetization has led to a 50% saving in weight of steel, copper, insulation, and oil in the 3-kva. transformer.

The electric-motor industry provides another example. Use of Formex insulated wire in place of treated cotton insulation reduced insulation thickness necessary to obtain required dielectric strength. Motor size is smaller, winding cost is lower, and less steel is needed.

Better Materials

The development of porcelain enameling has been marked by improved opacifiers and by decreases in application weight. These enamels have maximum opacity and high-quality acid resistance with minimum weight. Often mild steel, instead of premium enameling iron, can serve as the base material.

An increase in price of a material may also decide a substitute. Cotton braid and fillers became more expensive because of labor costs. Accordingly, glass fiber is replacing cotton for insulating material in wiring and cord sets.

These examples serve to illustrate that better materials reduce the size of the product and, in most cases, the cost of manufacturing. Significant advances in materials make possible the new products that would otherwise remain the dreams of designers.—Prod Eng, June, p81

WIDE DRIVEWAYS assure ready maneuverability of highway vehicles

Modern Freighthouse Trends

SINGLE STORY, spread-out modern design is responsible for faster handling and lowered costs at many new less carload lots freighthouses. Important features include fire-resistant construction, adequate platform space for movement and temporary storage, and wide flanking driveways for greater maneuverability of mechanized equipment. This modernized approach to present crowded conditions is possible due to the movement away from congested city areas and allows room for future expansion.

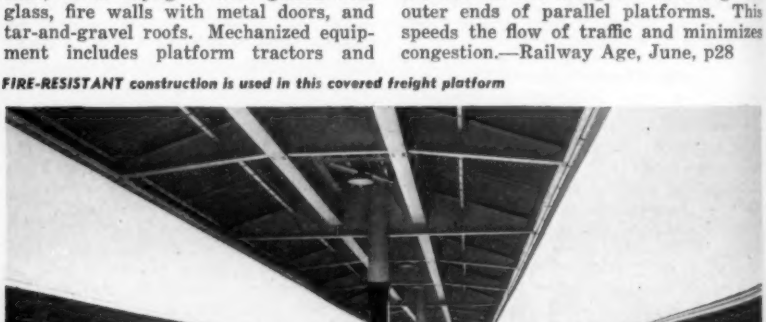
Safeguard measures include brick or reinforced concrete walls, reinforced concrete floors, metal window frames and sash, metal skylights with glazed wire glass, fire walls with metal doors, and tar-and-gravel roofs. Mechanized equipment includes platform tractors and trailers, lifting platform trucks, and fork-lift trucks. Pneumatic tubes and an intercommunication system linking key personnel are common features of the modern freight station.

Well lighted, attractive working areas employing modern construction allow pleasant surroundings for work and meeting customers.

All important fire-fighting equipment usually combine both fire hose and chemical extinguishers. Hydrants can be located under trap doors on the loading platforms or the valve stem may extend above platform level.

Operating efficiency is increased by the use of lift bridges connecting the outer ends of parallel platforms. This speeds the flow of traffic and minimizes congestion.—Railway Age, June, p28

FIRE-RESISTANT construction is used in this covered freight platform



Germany's Export Trade Up But Not Up Sufficiently

Germany's export trade this year ran 25% ahead of 1949 first-quarter figures. But the increase is insufficient to pay for imports—only covers half of them. The country will not be self-sufficient by 1952 when Marshall Plan aid ends.

Three problems face German industrialists hoping to broaden export trade:

- Lack of credit facilities to finance capital exports. Spain, needing locomotives, railroad cars, and diesel engines, asked Germany for 4-year credits. As Germany was unable to extend the credit, the business went to Britain, Belgium, and Italy.
- Manufacturers are using obsolete equipment. Labor is cheap but does not replace good equipment. The physical plant necessary to produce this equipment is forbidden.
- Lack of means to cultivate world markets. Sales personnel can be sent overseas on visits but cannot establish permanent agencies.

A corporation is being established now in New York City, with branch offices in other key cities, to promote German brand names. Exporters working through these offices will be permitted to retain a part of the dollars earned in the U. S. Germany will accent export of special industrial equipment such as precision instruments and machine tools that require a high proportion of low-cost labor.—Business Wk, June 10, p121

Ethiopian Oil Exploration

The first oil well drilled in Ethiopia turned out dry, but geological and geophysical work is being continued by Sinclair Petroleum Co.

The wildcat was abandoned at 10,000 ft. after drilling from May 1949 to April 1950. It proved to be a most difficult area to drill. Region is arid, full of lions, and roamed by troublesome nomadic tribes. Surface rock was so hard that it took 13 bits to drill the rat hole, 24 ft. deep and 12¼ in. in dia.

The site for the second test has not yet been chosen. Meanwhile, exploration work includes magnetometer studies.—Oil & Gas J, Apr 27, p81

Swiss Variable-Speed Gear

The Kopp Variator, developed in Switzerland, is a stepless variable speed gear. Power range is ¼-12 hp. with a mechanical efficiency of 90%.

The coaxial input and output shafts of the gear each carry at their inner ends a hardened steel disk. Peripheries of disks bear against a series of steel balls that transmit the driving power between shafts.

When balls rotate on spindles normally parallel to shaft axes, output speed equals input speed. Moving balls about their centers and tilting their axes of rotation by movement of a control plate changes contact areas and therefore output-input speed ratio.

Range of speed variation is from one-third below input speed to three times above it, a total of 9 to 1.—Mach, May 27, p814

Chile Adds Blast Furnace

South America's industrial growth moved another step forward late this spring when Chile's first steel mill became completely integrated with blowing in of a blast furnace. Pacific Steel Co.'s mill now includes 57 new Koppers underjet coke ovens, blast furnace, openhearth furnace, bessemer converter, and finishing facilities.

Blast-furnace capacity is 700 tons per day. Mill annual ingot capacity is 260,000 tons. Finished products include sheets, tinplate, galvanized stocks, reinforcing bars, and merchant mill products.

Most of the output will go into the Chilean domestic market. Some will be exported.—Iron Age, Apr 27, p104

Plastic Display Signs Made On Neon Equipment

PLASTIC SIGNS are being made on neon equipment. First a full-color, full-sized sketch is made. Then . . .

COLOR is transferred and hot, soft sheet is removed from oven. Sign is ready for . . .

FINAL ASSEMBLY on metal frame containing lights.—Business Wk, June 10, p50

New Galvanizing Furnace Reduces Dross Formation

Dross has always been a costly nuisance in galvanizing. Caused by reaction of steel kettle and molten zinc, it settles to the bottom of the kettle, has to be cleaned out at regular intervals, and subjected to distillation for zinc recovery.

A new furnace is claimed to reduce galvanizer's dross. It is a refractory-lined, low-frequency induction unit. The container, of rectangular shape, has an inclined flared opening leading into the side wall. A twin-coil inductor unit is mounted so that its melting channels are aligned with the wall opening.

Heat is generated in the inductor unit and constantly heats the metal. The metal in its circulation enters the upper zone of the bath only and does not disturb the bottom section. Thus, any dross that does form from contact between zinc and steel objects or iron salts is allowed to settle out without contaminating the metal above.

Other advantages of the new furnace, which is made by **Ajax Engrg. Co.**, include close temperature control, comfortable working temperatures, and absence of exhaust gases and fumes.—Iron Age, Apr 13, p93

Radioactivity Air Filter

New, inexpensive material filters fine radioactive particles from contaminated gaseous wastes. It was developed by Arthur D. Little, Inc., for the U. S. Atomic Energy Committee.

The material contains treated paper-making fibers in combination with finely divided mineral asbestos fibers. It is made in soft, flexible sheets, which can be pleated and formed into shapes to fit filtering units.

Industrial applications are likely, such as in filtering smokestack gases that now cause fumes or smog.—Nucleonics, May, p70

Pumping Deep Oil Wells Demands Improved Equipment

Steadily increasing producing depths of oil wells create greater load demands on pumping equipment. In recent years, maximum operating depth for sucker-rod pumps has been increased by improved rods and new developments in surface units.

Present sucker-rod equipment, powered by a hydraulic unit, can pump 100 bbl. of oil per day from almost 15,000 ft. Such an installation could consist of 20-ft. by 1¼-in. subsurface pumps, a 1¼- to ¾-in. tapered string of rods, and a hydraulic pumping unit with 20-ft. stroke. Similar maximum producing depth for the largest conventional beam unit at 100 bbl. per day is about 12,500 ft.

Subsurface hydraulic pumps actuated by power oil from a surface power unit have some desirable features for deep-well pumping. Rod-string maintenance is eliminated, and the new "free" type pumps can be removed for maintenance without pulling tubing.—Oil & Gas J, May 18, p134

New Food Plant for Mexico

Monterrey, Mexico, now boasts a modern, $2-million food processing plant. Anderson, Clayton & Co., Inc., designed and built the plant.

Products will be hydrogenated vegetable shortenings, margarine, cooking and salad oils, salad dressings, and peanut butter. Annual capacity is 50-million lb.

Central feature of the new plant is a four-story processing building. Tank cars bring crude cottonseed oil to this building from oil plants in various parts of Mexico.

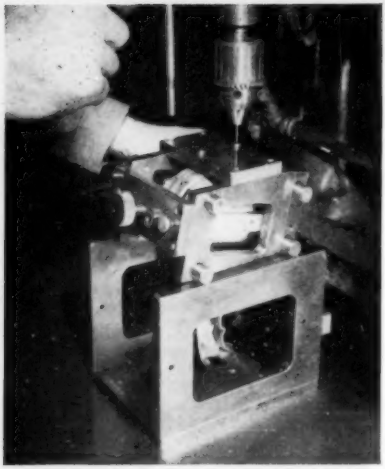
Oil is refined to remove fatty acids and further purified by several washings. A 72-hr. cold treatment crystallizes stearines in the oil. Stearines are then removed by filtration.—Food Ind, Apr, p77

Lift-Dump Eases Handling of Barrelled Liquids, Solids

BARREL containing liquids or solids is positioned against rubber gasket in lifting cradle. Material flows through . . .

STAINLESS steel trough at top of cradle. Hand crank raises barrel. The hydraulic lifter eases job of filling . . .

HIGH-LEVEL containers. Entire job takes 30-45 sec. Equipment is made by Lee Metal Product Co.—Factory, June, p138



NOVEL DRILL-JIG SUPPORT

Drill jigs for motor housings of Skilsaw, Inc.'s sanders-polishers are lightweight and leave the tool handle out in the open. Tool handle is die-cast in one piece with the housing. When drilling is done, the jig is held either on U-shaped rail frame that contacts ground buttons on jib exterior or directly on drillpress table endwise.—Am Mach, May 29, p105

Pre-Weld Reinforcing Mat

Reinforcing steel used on a California housing project is preassembled and welded in templets saving time and eliminating costly replacement errors. Four templets are used to form the eight mat shapes used, opposite-hand reinforcing assemblies being made simply by turning templet over. Mats are 12 x 16 ft.

Templets are wood with trough-shaped ⅝ x 1½ x 2-in. blocks to hold steel. Stock, in desired length, is stored next to templets. Four men place steel. Welder tacks steel just frequently enough for mat to remain intact.—Cons Meth & Equip, May, p48

New Equipment Increases Safety of Foggy Landing

In an effort to make instrument landings safer and to lower acceptable flight minimums, Sperry Gyroscope Co. has developed the Zero Reader. Largest orders are for military aircraft, but considerable interest is shown by commercial airlines and owners of executive planes.

The reader combines information normally supplied by the gyrohorizon, directional gyro, magnetic or Gyrosyn compass, sensitive altimeter, and instrument landing system cross-pointer meter.

A coupling device, automatic or semi-automatic, is necessary to land safely aircraft under low visibility conditions. ILS tolerance figures and localizer deviation sensitivity have assumed greater importance because of coupling requirements and clarification of approach visualization. This is the pilot's mental image of the aircraft in relation to the runway, its displacement off the centerline, and how soon the wheels should touch the pavement.

The reader affords a more accurate visualization, and together with runway distance markings, center, and borderline markings, it gives better reference guides for the contact landing.—Aviation Wk, June 12, p21

Jolt-Squeeze Molding Unit

A simultaneous jolt-squeeze molding machine, developed by Stone-Wallwork, Ltd., of England, avoids density variation throughout a rammed mold. The jolt piston operates in an anvil resting upon a coil spring. This spring in turn rests inside the squeeze cylinder, which operates in an external squeeze body.

Squeezing and jolting take place at the same time. Time is thus saved in the cycle. Another advantage is that the sand is rammed laterally as well as vertically. This action aids in producing accurate castings.—Foundry, May, p250

Australia Welds Its Bridges

Dept. of Main Roads has used principle for all bridges since 1936. Saving in steel weight runs 20%; cost savings is 13%

AUSTRALIA BUILT its first welded truss bridge in 1936—a 100-ft. span at Barraba. Since 1936, all major bridges built by the Dept. of Main Roads have been welded. Fourteen have been finished, four are under construction, two are being designed, two have been proposed.

Most notable of the welded structures is the Hamkesbury River bridge. It has two 438-ft. K-type through truss spans and nine 90-ft. welded plate girders.

The term "welded bridge" in Australia does not mean "all welded." The Barraba bridge is the only "all-welded" bridge there. Other bridges are shop-welded and field-riveted. Simple span-plate girder bridges are all-welded. But continuous plate girders are shop-welded and field-riveted, as are towers for lift bridges.

Four main savings accrue from welding: utilization of gross sections for tension members, better distribution of metal in compression members, elimination of costly lacing of upper chords and end ports, no deductions necessary for rivet holes in flanges of cross girders.

The saving in weight of all-welded as compared to all-riveted construction is 20%. Cost saving is 13%.

Principle considerations in design and construction of all-welded bridges are:

Composition of Steel—An upper limit of carbon content of the steel must be set to assure good weldability. As carbon content increases, ultimate strength increases but ductility decreases. Standard Association of Australia has set a 0.3% maximum carbon content. Other elements in steel reduce its ductility, but not so much as carbon.

Effects of Notching—Added stresses are increased in welds or in parent metal by notches in the structural metal. With proper design and construction precautions, failures are not likely to occur. Butt-splices of flange-plates should be located some distance from the center of the span. Butt-splices of web plates should be near the center of the span to avoid heat shear.

Fatigue of Metals—Fatigue of metal from cyclic stressing is important in both welded and riveted design. Permissible stresses for welded work are lower in Australia.

Rapid Cooling of Weld—Rapid cooling of the metal mass reduces ductility. The thicker the plate the more rapid is the heat dissipation, causing brittleness in the weld. To avoid too rapid cooling,

CONVEYORIZED ASSEMBLY BENCH

Unusual assembly bench at Stewart-Warner Corp. is 110 ft. long in U shape with 33 work-stations on starting side and 28 on finishing. Fifteen vertically positioned flat belt loops, arranged in two levels, carry sheet-metal carriers designed to hold speedometer cases. At station shown, operator mounts pointers on assemblies taken from top conveyor, then places them on lower conveyor for transport to next operation.—Am Mach, May 1, p78

practice specifies the minimum area of weld run for any plate thickness. Thus, fillet welds must be at least 3/8-in. nominal size for plates 1 in. thick.

Contraction on Cooling—Prevention of contraction of the weld on cooling will produce stresses in the weld. When plates being butt-welded are on a surface on which they cannot slide, the weld cracks or at least yields. To prevent this contraction on cooling, a definite welding practice has been evolved. Web and flange plates are completely welded individually prior to assembly. All welds are free to contract.

The complete plates are then assembled, together with stiffening angles. The assembled members are first tack-welded; then they are completed by continuous fillet welding.

Distortion from Welding—Two measures must be taken to avoid distortion caused by contraction. Welding runs should be balanced by symmetrical proportions in relation to the unit being welded. If member is built up from separate plates, welds should be symmetrical to the whole.

Reduced Design Stress—Allowable stresses for butt fillet welds are 70% of stress permissible for the parent metal. Butt welds in direct tension members can be used in direct tension only under dead load.—Eng News-Rec, June 1, p39

Automatic Pipe Finishing Reduces Handling, Costs

Two duplex cutoff machines, six duplex chamfering machines, and four duplex threading machines provide close production control and economize floor space for the National Tube Co.

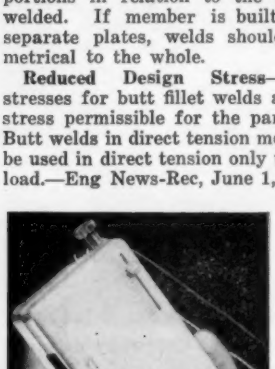
The chamfering and threading machines are arranged in three rows with indexing equipment for conveying the pipe to and from the machines.

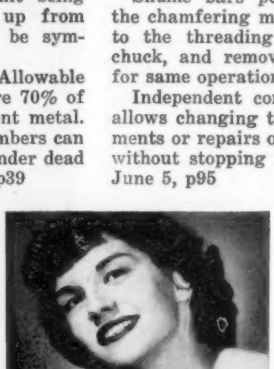
Inlet and outlet tables for handling pipe serve the cutoff machines, which crop the pipe to proper length before chamfering and threading. Selector pushbuttons allow one or both cutoff heads to be loaded so that two lengths of pipe can be processed at the same time.

A measuring device, set at a predetermined position, closes the chucks and stops the inlet and outlet tables. Cut lengths of pipe are kicked off on cradles.

Shuffle bars position two lengths in the chamfering machine, transport them to the threading machine, position in chuck, and remove to far end of table for same operation to the opposite end.

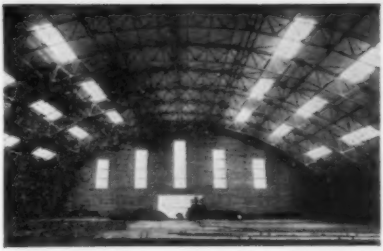
Independent control of each machine allows changing tools or making adjustments or repairs on one spindle at a time without stopping the entire line.—Steel, June 5, p95





MIDGET RADIO

It weighs only 5¼ oz., measures 4x2½x1 in., fits into your shirt pocket, yet this midget radio receives standard 550-1500 kc. broadcasts. Speaker is similar to a standard hearing-aid ear piece. Power is from a one-cell penlight A battery and one 22½-v. hearing aid B battery. Life of the former is 20-30 hr., the latter 60-80 hr. Radio is made by Micro-Electronics Products, Inc. — Mod Plastics, May, p71



ACRYLIC PLASTIC USED FOR GLAZING

Resistant to breakage and ease of installation have made acrylic plastic a widely used glazing material. In tests, a ¼-in. thick sheet of plate glass was broken by a ¼-lb. steel ball dropped 2½ ft. It took a 36-ft. drop of the same ball to break a sheet of Plexiglas of the same thickness. Available in clear transparent or white translucent sheet, the latter is used where light diffusion is desired. Acrylic is easy to handle, can be sawed with a wood-working band saw; thin sheets can be broken easily if scored on both sides. It is easy to shape if heated. At left, an Atlantic City hotel sky cabana is enclosed with acrylic. Formability permitted curved-corner glazing and custom corrugations. At right, white, translucent corrugated acrylic is to match corrugated aluminum sheeting in the University of Delaware field house.—Mod Plastics, May, p72

World's Largest Pumps Assembled by Welding

King-size job being done by the Pelton Wheel Co. is the manufacture of six huge pumps for the Grand Coulee pumping plant on the Columbia River, not far from Spokane, Washington. The six pumps will furnish 850-million gal. of water per day to irrigate 11-million acres of desert-like land.

The pumps, claimed to be the world's largest, are being fabricated to a large extent by welding. Steel up to 5 in. thick must be welded. As the heavy sections tend to crack when welded, lime ferritic E-6016 electrodes have been adopted after various types were tried.

Their low hydrogen content minimizes hydrogen pickup in the weld areas. A slight preheat also helps to prevent cracking. Another advantage of the lime-ferritic electrode that influenced its choice is that vertical welding in a deep-groove weld is practical.

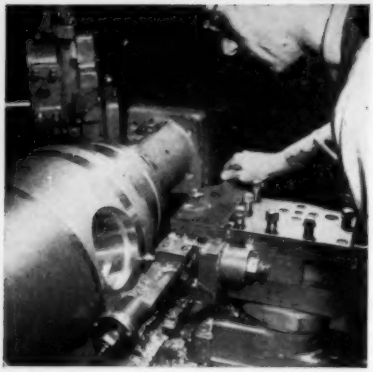
Pump casings are fabricated in halves, which will be bolted together to form the entire volute. Casing sections are joined by stringer welds, turned over, flame-gouged, welded, turned, flame-gouged to clean the weld, then finish welded. A turnbuckle, when casing is welded to shoulder casting, holds the two together; it is removed after tack welding.

One point of interest is that once a weld is started, welding does not stop until the weld is completed. Twenty-four hours of continuous welding is not uncommon.—Weld Eng, May, p22

Bores Semicircular Holes

To bore semicircular holes for reinforced concrete soldier piles, Sure-Bottom Foundation Co. first bored 18-in. dia. holes to desired depth. Then cutter-bucket, driven by an air hammer, made hole semicircular.

Bucket is round-hole size with trap-door bottom. Cutter has two flights. In driving, the lower flight makes pilot cut, the upper completing cut. Clay drops into bucket.—Eng News-Rec, June 8, p46



RELIEVES LARGE PISTONS

Forged aluminum-alloy pistons for Nordberg stationary radial engine are relieved for circular length of 8 in. on each side of piston-pin opening. This allows space for bearings and fittings. Job is done by carbide-tipped lathe tool guided by cam follower contacting drum cam bolted to faceplate adopter. Compression spring in toolholder keeps follower against cam. Tool advance is controlled, so tool does not spring forward into hole and gouge far edge.—Am Mach, Apr 17, p88

Circuits Buried in Plastic

One of electronics most useful design tools is potting of components and circuits into clear or opaque plastics materials.

Currently popular polyesters with proper physical and electrical properties are used for embedment compounds. Polystyrene gives optimum electrical characteristics. Mineral-filled polyesters resist high temperatures (300° C. for half-hour tests), while proper blending of fillers varies expansion coefficients.

Placticizers and reinforcing-type fillers are effective for low-temperature operation (-80°C). Metallic fillers or cooling fins achieve good thermal conductivity. Special application properties can be made to order.—Electronics, June, p66

UHF Television Field Test with Satellite Station

The first experimental satellite station for long-term evaluation of ultra-high frequency (uhf.) television reception has been installed in the U. S. Fifty television receivers with uhf converters also have been installed for qualitative tests and field strength measurements.

The station is 53 miles from New York City and will pick up programs from a station in that city. Transmitting antenna is a 210-ft. tower with a directional dish antenna at the 160-ft. level.

Information being sought includes:

1. Distances at which a given field strengh can be produced by a station using practical antenna heights, economical transmitting power, and optimum transmitting antenna gains.

2. Service range as it is limited by noise in receiver input circuits, relative to field strength.

3. Effect of obstructions that cause diffraction, shadows, and multipath effects.

4. Signal variation.

5. Distances at which station will produce field intensities capable of causing interference to other stations on the same channel.—Electronics, April, p70

Fir Bark—New Source of Wax

Wax will be extracted from fir bark by theOregon Wood Chemical Co. This will be done in addition to making molasses from wood waste.

The process was developed at the Oregon Forest Products Laboratory. Ground bark is treated batch-wise with hot benzene, hexane, or chlorinated hydrocarbons for 3 hr. The extract is then pumped to an evaporation chamber where the solvent is distilled off with steam, leaving wax in the bottom of the evaporator.

The wax is harder than beeswax. Yield is estimated at 120 lb. per ton of oven-dry bark.—Chem Eng, Apr, pPPI-37

Economy Principal Factor in Processing-Plant Design

Predominant trends in natural gasoline and cycling plant construction have economic considerations — operating and maintenance costs. Today's plants must accept wide variations in feed composition and through-put and still wider variations because of changes in market demand.

Refrigeration or provision for its future installation is an accepted necessity for plants of 25-million cu. ft. per day or larger. Economical limits are ½-1 ton per installed horsepower. The most common applications are condensing ethane reflux and absorption problems in conjunction with oil absorbers.

The most efficient operation in oil absorption results from installation of internal elements in the absorber to offset heat of absorption. It is thus possible to have outgoing oil no colder than incoming gas and the residue gas no colder than incoming absorption oil.

Such an absorber needs no insulation and no heat exchangers to recover part of the refrigeration effect otherwise lost. —Oil & Gas J, Apr 20, p158

How to Pack Tinplate

Packaging of tinplate is a good example of the utility and protection requirements that the steel industry faces. Tinplate is sold as base box—31,360 sq. in. or 112 sheets of tinplate.

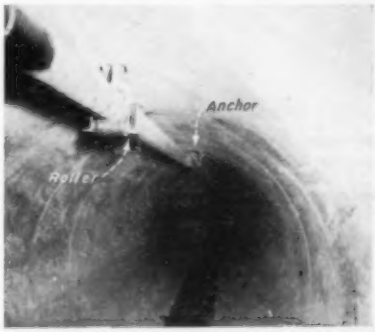
Weirton Steel Co. has studied this packaging problem for some time and concluded that:

- Water repellent paper will not prevent loss from severe sweating of the sheets.
- Paper linings can best be sealed at the platform by full length angles laid along the bottom of the wooden platform skids.
- All corner angles must be cushioned to prevent tearing the paper lining.
- A metal wrapper and metal container will not prevent loss from sweating without a large overlap of joints or use of waterproof paper lining.
- Rust inhibitors will not prevent loss from severe sweating.
- During sweating, water forms on the outside of the package and penetrates wrapping or lining if it is not waterproof.—Iron Age, June 1, p81

Three-Dimensional Television

Three-dimensional (or stereo) television is a reality. At Argonne National Laboratory, atomic researchers use the sets to see what happens when radio-active materials are brought together by remote control. Set was developed by Allen B. Du Mont Laboratories, Inc.

Dual images are viewed on a stereo-receiver screen. Operator, wearing polarizing glasses, sees only one image. Twin-lenses of camera are spaced the same distance apart as human eyes.—Business Wk, June 3, p26

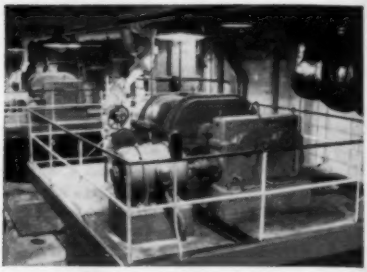


CROSSES GREAT DIVIDE

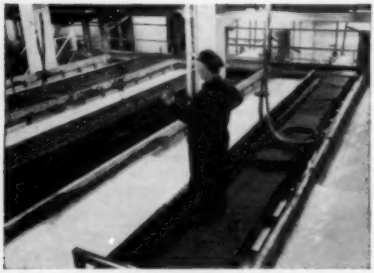
U. S. Bureau of Reclamation thread a cable through the Rocky Mts. rather than build a tower line over the top at 11,850 ft. The gas-filled pipe-type cable is installed in 13-mi. irrigation tunnel on hangers. Pipe rests on rollers and is prestressed to prevent movement during wide temperature variations.—Elec World, Apr 24, p95

Modern Sulphite Bleaching Demands . . .

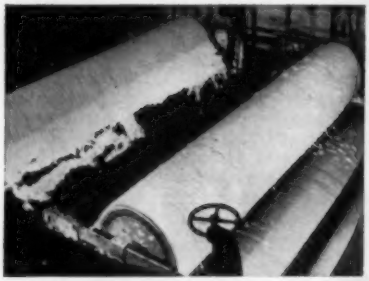
SHERBROOKE washers, used at various processing stages, have individual control panels



DOUBLE-SHAFT mixers on top caustic and hypochlorite towers prepare pulp for treatment

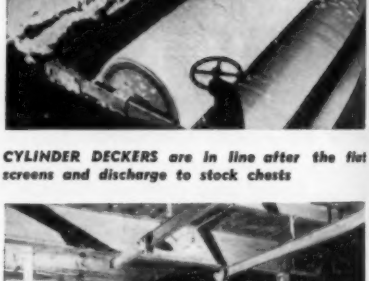


BLEACHED PULP is screened in four parallel lines of Smythe flat screens



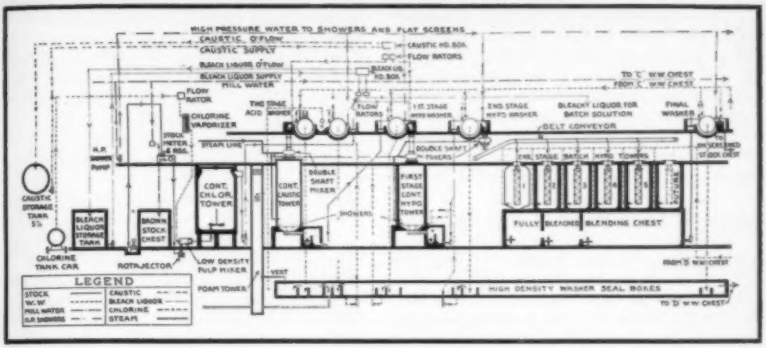
CYLINDER DECKERS are in line after the flat screens and discharge to stock chests

KAMYR 80-in. wet machine runs on screened bleached stock of sheet size 2-36 in. x 40 in.



OLIVER ROGERS 72-in. wet machine runs on unscreened or screened bleached stock

. . . The Best in Methods, Layout, Equipment



FLOW DIAGRAM shows the five-stage system adopted in the Eddy Co.'s . . .

New Bleached Sulphite Plant

Good processing methods, layout, and equipment combine to produce bleached sulphite for making paper products of highest quality

MODERN, EFFICIENT sulphite bleaching has been achieved at E. B. Eddy Co.'s new plant at Hull, Quebec, Canada. The bleachery has a capacity of 150 tons of pulp per day.

The bleaching system consists of four continuous stages and one batch stage as follows: continuous low-density chlorination, continuous high-density caustic treatment, continuous low-density caustic soak, continuous high-density hypochlorite bleach, and a batch high-density hypochlorite bleach.

The last stage was made batch because it was believed that batch operation would give closer control of final pulp brightness. Also, it permitted three existing batch towers from the old plant to be retained.

Stock is chlorinated in the first stage. After 1 hr. retention time, chlorinated stock at 3% consistency overflows from the tower, is diluted, and pumped to a double-unit Sherbrooke washer-thickener. It discharges at 16-18% consistency.

Caustic is applied by a drop pipe ahead of the shredder and screw conveyor that carries stock to the caustic stage. Shredded pulp drops into a pulp mixer where steam is added. Pulp then discharges into the high-density caustic tower for a 2-hr. treatment.

The pulp is withdrawn by a tower scraper and metering screw to a dump chest where dilution reduces consistency to 3%. It is washed by a washer-thickener equipped with washing showers, two press rolls, shreader, and conveyor discharge.

The low-density caustic soak is not yet in operation, so calcium hypochlorite bleach and caustic soda are added to the pulp leaving the shredder and passing to the high-density hypochlorite tower. Pulp from the tower is discharged to a mixer, then conveyed to any one of five

batch towers for the second hypochlorite bleach.

All five batch towers dump into a common agitated dump chest. Retention time in batch towers is 4¾ hr. The pulp is then pumped to a washer and discharged to the unscreened-stock chest.

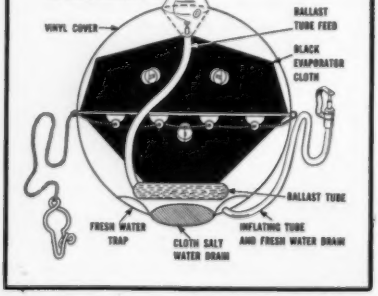
As some heavy dirt particles enter the stock during bleaching, the pulp is screened before it is supplied to the wet machines.—Paper Ind, Mar, p156

Makes Sea Water Potable

Two pints of fresh water per day are converted from sea water by a 24-in. dia. solar still developed by U. S. Fiber & Plastics Corp. The U. S. Navy is using the still as standard equipment for air men downed at sea.

Outer skin is 6-mil inflatable Vinylite film. Inner skin is black cotton cloth. Skins are held apart by 32 vinyl tabs welded to plastic skin. To operate, a drain cloth at the bottom is first soaked. The still is then thrown overboard and water is poured through its funnel. When the tube running through the sphere is full, the sphere is held upright in the water.

Sun's rays pass through the vinyl skin and heat sea water on the black cloth, causing evaporation. Vapor condenses on the inside of the outer skin and drips down into a trap at the bottom.—Mod Plastics, June, p68



WITH VINYL outer skin and black cloth inner skin, this solar still converts sea water to drinking water. The U. S. Navy will use it.

Warm Glass, Warm Hands

Cold glass on a counter where clerks work constantly can cause swollen fingers, cracked skin, and even chills from heat loss through their fingers.

An American travel bureau solved this problem by installing a soil heating cable beneath the counter. The cable was laid flat on an asbestos sheet covering a false bottom in the counter and fastened to notched wooden headers nailed to the false bottom.

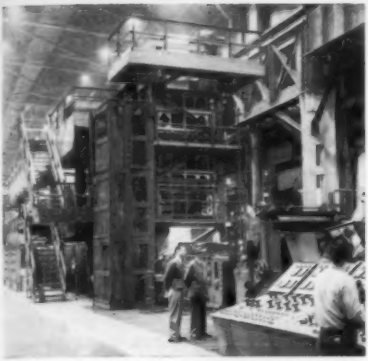
The 1¼-in. deep cavity was then filled with sand to store the heat and distribute it evenly over the whole surface. The sand was covered with a veneer board and cloth.

A thermostat controls the temperature. Energy consumption at 70° F. air temperature is 100–120 kw.-hr. per month. At this room temperature, the thermostat is set at 100° F.—Elec West, May, p75

Drop-Forging Productivity

The productivity team from the English drop-forging industry recently published its report on a tour of U. S. drop-forging plants under sponsorship of the Anglo-American Council on Productivity.

Basing its findings on comparison of about 20 forgings, the team claims that the American forge will produce up to 400% more forgings per hr. than a corresponding British forge. Some of the reasons observed were wage incentives, purchasing power of wages, good employer-employee relations, superior forge layout, plant ventilation, large furnaces. —Mach, May 6, p694



TINPLATE ½-MI. PER MIN.

Weirton Steel Co., subsidiary of National Steel Corp., is tinplating steel electrolytically at the rate of ½ mi. per min.—nearly twice as fast as standard. In its new tinplating plant, strip gets undercoating on lower deck of this triple-deck plater. Reverse side is plated on the middle deck, and electrolyte is washed off on top deck. Industrial trend is to electrolytic plating in place of dipping. Last year 54% of the national production was done electrolytically. Proportion should reach 90%.—Business Wk, May 6, p58

Airplanes Influence Autos

Aviation long has stressed safety features that may be adaptable to automobiles. Improved vision, driver comfort, ease of control, and interior padding arrangement for crash survival are possible safety applications to cars.

Interesting point suggested is an interlocking arrangement of hinged front-seat backs to doors to prevent rear occupants from forcing front-seat riders into windshield or instrument panel. Another is red lighting of instruments and controls to give a minimum effect on night vision.

Aviation structural materials of high quality have beneficially effected high-strength automotive steels.—Auto Ind, May 15, p35

New Hammer Grab Tool Speeds Port Rebuilding

Le Havre is back as a major port, much of the speedy rebuilding having been facilitated by a new tool called the hammer grab. The tool both digs and mucks for foundation caissons.

The hammer grab is essentially a cylindrical weight on top an orange peel-like set of cast steel jaws. Jaws pick soil when wedged in the open position and lift soil when closed. Tool can be adapted to varying types of soil by changing the jaws.

Usually, a hammer grab is used in conjunction with a casing. While ground is being excavated, casing is being lowered by its own weight. Sinking can be augmented by a semi-rotary motion imparted by arms atop casing.—Eng News-Rec, June 8, p44

Diesels for Underground Work

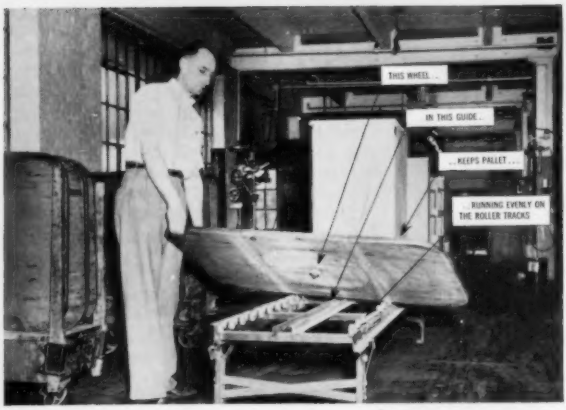
Few underground mining installations in the U. S. now employ diesel-powered units. But some companies are experimenting with diesel units as substitutes for battery-powered or electric-powered units.

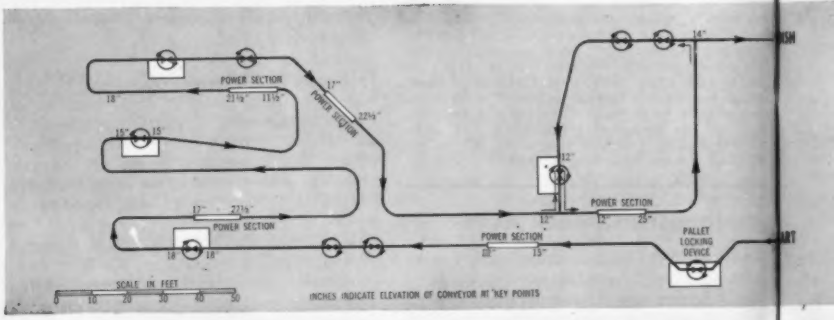
Universal Exploration Co. is using a 30-ton diesel locomotive on the long haul to shaft, with battery-powered units gathering. Diesel trucks are being used increasingly as are loaders and tractors. Eagle-Picher mine has 34 trucks, 18 loaders, a drill jumbo, a road grader, and a bulldozer operating underground.

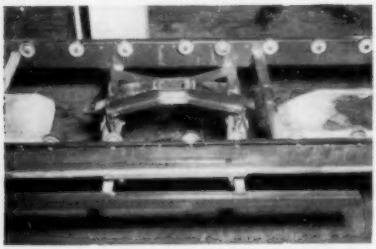
Advantages and disadvantages must be weighed in relation to lower power cost vs. higher ventilation costs. Diesel-powered units are not tied to power lines, and in this respect they are on a par with battery-powered units. Applied to trackless equipment underground, diesel equipment achieves maximum flexibility. Maintenance costs are slightly higher than for corresponding electrical equipment.—Engrg & Min J, May, p102

Good Handling Guided Conve

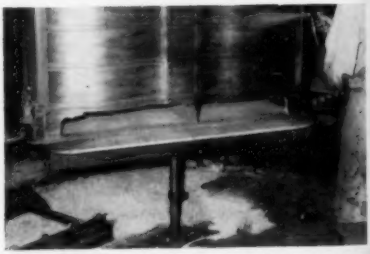
Low cost and flexibility are feat guided pallet conveyor developed Standard Co. Combines both g power flow, conveyor runs in 5 lengths, sections bolted to to the floor. Wheel into guid pallet centered. Power is a ½ motor. Capacity of 72x30-i 200 lb. Cost has been estimate the cost of a conventional system June, p92







Holding device grasps guide wheel to permit 360° rotation. Foot bar lowers holder.

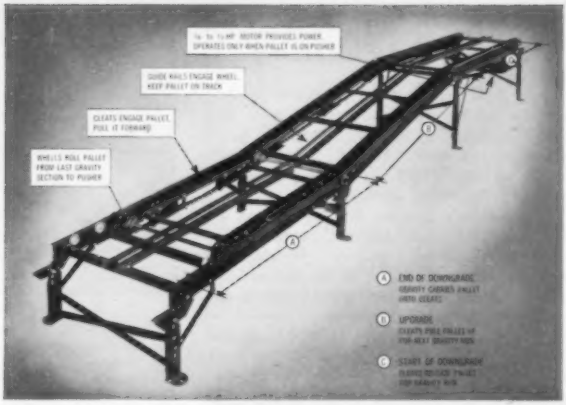


Hydraulic lift permits pallet to be raised. Automatic stop prevents jamming.

Switc of wi

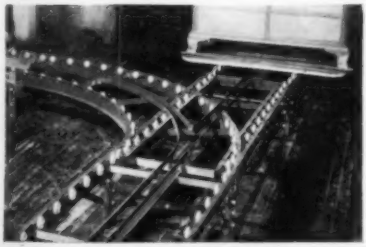
lan ling from d Conveyors

lexib ure features of the onve veloped by Rapids- Comb both gravity and ve ones in 5- and 10-ft. s bolted together and heel into guide, keeping . Pe is a ⅛- to ½-hp. of 72x30-in. pallet is as estimated as "half nvent l system."—Factory,

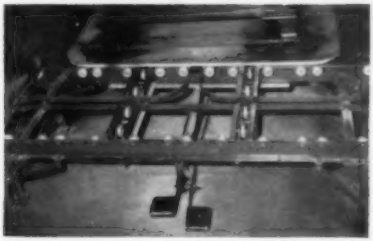

CLEATS ENGAGE PALLET, PUSH IT FORWARD
WHEELS ROLL PALLET FROM LAST GRAVITY SECTION TO PUSHER
A END OF DOWNGRADE
B UPGRADE
C START OF DOWNGRADE

Flow diagram (left) of the guided pallet conveyor at the Kindel Furniture Company. All finishing operations are preformed on 700 ft. of guided power conveyor. Total area is less than with manual handling. Process time has been cut 50%.

Gravity section (right) can be lifted, jack-knife fashion, when crossing conveyor line. Eliminates need for walk-over stairs, permits full use of area within loops for working or storage.



Switching is facilitated by transverse rows of wheels, raised or lowered by foot rail.



Spur curve permits pallets to be shunted from main line or serves bank or feeder lines.

Pre-expellers Improve Cottonseed Oil Processing

More oil of better quality from cottonseed is the result of using the new Exsolex process at Delta Product Co.'s Arkansas plant. Other advantages: lower solvent losses, reduced processing costs, fewer fines, better meal.

The Exsolex process was developed by V. D. Anderson Co. Cottonseed is cleaned, delinted, hulled. Meats are cooked, then passed through pre-expellers where moisture is adjusted in the cookers above the expellers.

Oil from pre-expellers is screened and filtered. Cake from filters is fed back into stream of meats going to pre-expellers. Cake from pre-expellers is broken into small pieces, treated, and passed through flaking rolls.

Flakes are conveyed to top of extractor in the solvent plant and fall by gravity through the solvent. Oil dissolves in the solvent, and the mixture is passed through an evaporator to remove the solvent. Oil settles to the bottom of the evaporator and then stripped of any remaining solvent in a bubble-cap column.

Performance: 375 lb. of oil from 2,000 lb. of cottonseed—18 lb. more than by the direct solvent process; 0.3% residual oil in meal compared with 2.6%; 20 gpm. of solvent pumped to extractor instead of 60 gpm.—Chem Eng, June, p106

Long-Wearing Castings

New technique for casting cylinder sleeves that require no annealing has been developed by Perfect Circle Corp. Castings are gray as cast, free from dirt, scale, not porous, and not subject to shrinkage. Technique uses spinning machine on which handling of all molds is automatic together with time, temperature, and thickness controls. Sleeves possess best features of centrifugal and statically cast methods.—Steel, June 5, p104

CREAM FOR YOUR COFFEE

Vending machines serving coffee can add the "cream" by using these high-fat pellets equivalent to half cream and half milk. Pellets are ground together with coffee and sugar (also pelletized). Cream pellets simulate fresh fluid cream.—Food Ind, June, p52

How to Save Water

Water scarcity in many areas of the world has increased the necessity to reduce water consumption. Air-conditioning systems can be large water wasters. Here are some ideas on how to conserve cooling water:

- Recirculating cooling water by using a cooling tower or an evaporative condenser. The evaporative condenser replaces the regular condenser.
- Using cooling water for other processes after passing through condenser.
- Air cooling, not water cooling.
- Installing automatic controls; they also boost system efficiency and save power.
- Raising compressor head pressure to reduce cooling-water flow. More power is used, but less water.
- Reducing air-conditioning load.
- Maintaining system properly.
- Drilling own ground well. Usually two wells are needed—one to draw from and the other for discharge.—Oper Eng, June, p35

Propellers to Drive Planes Faster Than Sound

About 18 months from today the first supersonic turboprop driven airplane may pass through the sonic barrier. Leading United States propeller designers are testing new ultra-thin straight blades in scale model propellers with diameters of 3 and 4 ft. High-speed propeller model tests recently indicated airstream speeds equivalent to Mach 0.92.

Before supersonic propeller-driven planes can become a reality several engineering problems must be overcome. Full-scale blades, at least as thin as the model blades, yet very wide of chord and super strong, must be produced. Problems of propeller gearing and controls must be overcome.

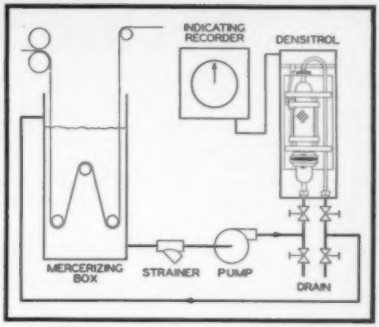
Until recently the top limit for a propeller-driven plane was put somewhere about 500 mph. Aerodynamic research since World War II has accounted for the big jump in propeller airplane speeds now forecast. A supersonic propeller blade can be shaped either by making it very thin, or by sweeping back its leading edge.

Sweep back propellers have been largely discarded in favor of a thin blade because of structural requirements. For reasonable efficiency around Mach 1 a thickness-to-chord ratio of the blade tip of about 2% is estimated.

Main economy of the high-speed propeller aircraft is expected to be in its efficiency at low speeds as compared to the turbo jet engine.—Aviation Wk, June 19, p12

Cleans Insulators Fast

Only one-quarter the time is now needed by Southern California Edison Co. to wash deenergized insulators and bushings in power substations. A portable washing outfit has replaced conventional equipment.



SAVES MERCERIZATION BILL

Liquid-density indicating and recording instrument for mercerizing ranges, developed by Precision Thermometer & Instrument Co., cuts operation costs. Lower amounts of caustic are used. Complaints from customers resulting from bad mercerizing—varying dye shades—are eliminated. It is accurate to ±3%. Instrument has been in commercial use several months.—Textile World, June, p106

The outfit includes standard orchard spraying equipment plus a 500-gal. tank mounted on a truck. The pump, driven by a 4-cyl. gasoline engine, delivers water to spray nozzles at 600–800 psi. Cleaning is done at distances of 10–15 ft. —Elec World, May 22, p134

Simplifies Brake Relining

Brake linings can be replaced without removing shoes by using explosive rivets. Mechanic releases lower shoe from the brake shoe spring and blocks it so all riveting can be done from above. If shoes are frozen to anchor pins, they must be removed.

New lining is clamped firmly to the shoe, with holes in lining and shoe aligned. Explosion should be toward the floor. Rivet strength, permanence, and firmness are comparable to solid rivets.—Fleet Owner, June, p47

Technical Shorts

Safe Lubrication—One of the most hazardous jobs in industrial plants is held by the oiler. His job exposes him to severe hazards of moving machinery. The way to reduce accidents on this job is to install extension grease pipes to bearings or switch to centralized lubrication. Another advantage: less grease used.—Power, May, p116

Renewable Hammer Faces—New rawhide jaw head hammer permits easiest replacement of faces yet developed. To replace, loosen the nut, slip a new face between the adjustable jaws, and tighten the nut. Hide used for the faces will not become soft or brittle under extremes of temperature, will not chip, or load up with metal particles.—Ind Dist, June, p118

Fuses Close Fire Door—Low-temperature fuses inserted in counterweight ropes on steel fire doors melt when heated, converting the counterweight system into a direct-weight system. Doors close automatically, sealing off affected area.—Coal Age, June, p109

Nailable Steel Truck Flooring—After 3 yr. of use in commercial truck trailers, it appears that Great Lakes Steel Corp.'s nailable, high-tensile, low-alloy steel flooring outlasts the truck. The 10-gage flooring is superior to wood in wear resistance, does not break through, is competitive in price, and holds nails tighter than wood.—Fleet Owner, May, p49

Triple-action Press—King-sized power press being built by Birdsboro Steel Foundry & Machine Co. for Lockheed Aircraft Corp. will tower 36 ft. high, have a die space 10x30 ft., and weigh more than 3½-million lb. Of 8,000-ton capacity, it will be the largest metal drawing press in the world.—Steel, June 5, p124

Non-ferrous Heat-treat—Induction heating of non-ferrous strip is accomplished at Westinghouse Electric Corp. by passing material between two opposing laminated pole structures. Field coils are so polarized that at any instant opposing poles have opposite sign and force flux through the strip.—Electronics, June, p190

Pile Driving Truck—Although lift-truck manufacturers may not recommend it, one American company substituted a lift truck for a pile driver. Trick was to attach a 5,000-lb. steam hammer to the forks with plant steam header furnishing power to the hammer.—Paper Ind, May, p187

Bugs Judge Waste—At Louisiana State University, tiny crustaceans known as Daphnia Magnus, which resemble small crawfish, are exposed to oil-refinery wastes. Purpose is to show tolerances of stream life for chemical pollution.—Oil & Gas J, June 1, p33

Tests Vise Squeeze—Holding pressure of vises is tested at Landis Machine Co. by closing vise jaws on a test ball held against a flat test specimen. Impression diameter is measured. Holding pressure is then picked from table of values, which are accurate to within 2%.—Am Mach, May 29, p93

COAXIAL CABLE RIVAL

New transmission line—a simple wire with special insulation and funnel-shaped terminals—may replace coaxial cable for many applications. Dr. George Goubau of U. S. Signal Corps Engrg. Labs invented the device. Advantages of new line: simple, highly efficient, cheap to make.—Prod Eng, May, p156

Model Tunnel Uses Steam—Steam instead of air is being used in a model tunnel at Pratt Institute, Brooklyn, N. Y. to eliminate the need for an expensive electric power plant and compressor system. The facility is connected to the Institute's 115 psi. steam lines. Size of the test section is 5 sq. in., nozzle throat area is 3.58 sq. in. Speed claimed is equivalent to Mach. 1.564. No fogging is reported, except at start-up. —Aviation Wk, June 19, p39

Spin Spinach—Shelf life of prepackaged spinach is lengthened by centrifuging to remove wash water from leaves. U. S. Dept. of Agriculture says that usual ½-min. spin is too short, that 4 minutes gives best results, reducing weight of washed spinach by 27.2%—Food Ind, June, p7

Studies Insulating Oils—Radioactive tracers, adapted to investigating electrical insulating oils, indicate that: (1) organic acids participate in sludge formation, (2) graphite powder absorbs most of harmful acid, and (3) compounds causing conductivity of oil may be of molecular size.—Elec World, Apr 10, p93

Pneumatic System Pays—The first pneumafil installation on worsted frames is expected to pay for itself in a year. Benefits: ends down cut 25%; spinning doubling eliminated; assignments per operator up 25%; waste price up 15%; weaving costs down 2½%; frame speeds increased from 6,200 to 6,500 rpm.—Textile World, June, p111

Mounting Metal Specimens—U. S. National Bureau of Standards has developed a cold way to mount small metal specimens for polishing and microscopic study. New method employs a denture material of modified acrylic resin, which sets at room temperature.—Weld Eng, May, p60

Stock-pile Bridges—Emergency bridges that are made from precast concrete "U" sections have been designed by the Bureau of Public Roads, U. S. Dept. of Commerce. Sections, 10-ft. long and 2-ft. wide, are assembled to a steel framework by threading cables through the members and stressing the cables enough to take the necessary load.—Prod Eng, June, p151

STEEL BANDS HOLD FORMS

Steel bands and wooden "wings" simplify making up and stripping concrete forms. Forms are standard tongue-and-groove. Steel column clamp at end assures squareness. Trapezoidal wings are cut from 2x6 lumber and toe-nailed lightly to form. Steel strap is precut and double-stapled on each face.—Cons Meth & Equip, June, p48

More Carbide—Waste lime sludge from calcium-carbide production will make more carbide in a National Carbide experimental plant soon to be built. Lime waste will be pelletized with coke and charged to electric furnaces to be converted to carbide.—Chem Eng, June, p73

Electric Motor Windows—Electric motors can be visually inspected at the Nekoosa-Edwards Paper Co. through plastic covers. This feature saves removing motor covers to see if brushes and commutator parts are in working order.—Engrg & Min J, June, p94

Protects Bread in Transit—Carboard tubes 5x10x20 in. permit delivery of bread to retailers in the shape it left wrapping machine. Mashing is eliminated, as is shrinkage from vibration. Tubes carry five standard loaves and are filled at wrapping machine.—Fleet Owner, June, p55

Turkey Promotes Free Economy

Encouraged by World Bank officials and promise of cooperation, Turkey has established a new bank dedicated to its industrial development

PROMOTING PRIVATE ENTERPRISE in underdeveloped countries has been so far little more than an idea in many bureaucratic minds. But one project is now ready to be tested.

Some months ago a group of Turkish bankers and businessmen, prodded by World Bank officials, decided that Turkish industry needed new capital and that the capital was available. The result is the Turkish Industrial Development Bank, which has now successfully passed through its development stage and will be doing business in a couple of months.

The bank is set up to help both the investor who wants to start a new industry and the manufacturer who wants a new machine for his mill. All comers —Turks and foreigners alike—are welcome. There is just one stipulation: the project must be run by private interests. No government participation is allowed.

The bank can make either loans or equity investments. But its governors have no intention of staying in any venture longer than necessary. They will offer to sell their holdings in each and every enterprise as quickly as possible. Object is to create a local capital market where none exists now.

QUICK TIME CHECK

Setting watches can be done in 3 min. with this new electric-acoustic apparatus. First coincidence of strokes between control watch and customer's watch will move pointer on a meter scale. Second coincidence will stop pointer, indicating how many minutes customer's watch is fast or slow. Headphones enable watchmaker to listen for defects.—Electronics, June, p170

Hidden Capital

A lot of capital is hiding out in Turkey, as there is in many under-industrialized countries. The need is for a mechanism, like a securities market, to lure out hidden capital and put it to work (see McG-H Digest, Mar, p17).

To start with, the bank's founders subscribed 12.5-million Turkish lira ($4.5-million)—not much by U. S. standards, but enough to make the Industrial Development Bank the biggest private bank in Turkey. Putting up the money are several banking interests including two branches of foreign-owned banks, a few business organizations such as the Istanbul Chamber of Commerce, and two manufacturers.

Revenue Sources

Beyond its subscribed capital, the bank has two big sources of revenue. First, the Turkish Central Bank has agreed to make loans to bolster the bank's reserves. Second, the World Bank is working out an arrangement to provide the necessary foreign exchange for the development-bank's needs.

World Bank normally makes loans for specific development projects. In the case

of the Turkish Industrial Development Bank, something new has to be worked out. Reason: the projects that the Turkish bank will finance are bound to be small—a lot of them perhaps in the $5,000 class. It would be impractical to go through the World Bank machinery for each project.

Compromise

A compromise along these lines is likely. World Bank may set aside some $9-million in an account made out to the Turkish bank. The Turkish bank could then draw on this account, subject to World Bank approval, to cover the foreign-exchange needs of any project.

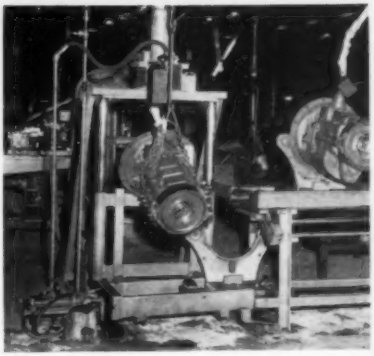
The bank's operations will be confined strictly to the industrial field. Turkey needs cement plants, food processing and canning plants, window and bottling glass works, and modern textile industry. The bank will not go into mining or agricultural ventures. Other agencies are being set up to work in these fields.

The Turks are trying sincerely to make investing in their country attractive to foreigners as well as to their own nationals. In April the parliament directed the Finance Ministry to set aside a fund of dollars to guarantee foreign investors against having their profits frozen because of exchange restrictions. No ceiling was put on the amount of profit that could be taken out of the country.

Fund Created

At the same time, the parliament created a $107-million fund to guarantee payment of private commercial loans to Turkey. If, in the government's opinion, the loan is beneficial to the development of Turkey's economy, the lehder gets a guarantee of repayment in full.

All these developments took place under the regime of President Innonu who left office in May. But the new regime under President Bayar is, if anything, more favorable to the encouragement of foreign investments.



KICKS FIXTURE BACK

This ingenious device at Clark Equipment Co.'s new industrial-truck transmission plant returns conveyor dolly to head of assembly line. At end of line, conveyor section drops to lower level when operator steps on pedal valve (lower left). When section hits bottom, it trips valve so piston of cylinder at left kicks dolly along lower return conveyor. —Am Mach, May 29, p65

Spray-Pond Design Factors

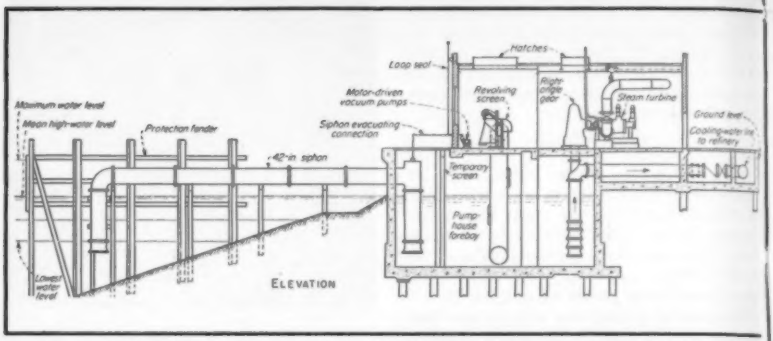
Where water supplies are limited, evaporative cooling by spray pond will save water for industry. A spray pond has about the same cooling capacity as a cooling pond fifty times as large.

A typical spray pond consists of a basin above which are nozzles to spray water upward. Usual practice locates nozzles 5–6 ft. above water surface, depending on water depth and curb level.

Nozzle pressure is 5–6 psi. with nozzles spraying 25–50 gpm. each. Nozzles should be spaced so average water delivered to the surface varies from 0.1 gpm. per sq. ft. for small ponds to 0.4 gpm. per sq. ft. for large ponds.

Outer nozzles should be at least 20 ft. from edge of basin. Louver fences, up to 12 ft. high, are needed for roof locations and where ground space is limited. —Power, Apr, p112

Dutch Oil-Refinery Pumping Plant . .



Oil refinery, being built for Caltex Petroleum Maatschappij, is nearing completion on the Maas River near Rotterdam, Holland. It will process 20,000 bbl. per day of Near East crude petroleum. Pump house is set on a dyke to keep intake distances short. Siphon-intake system of two 2-in. lines was selected to eliminate low-level-intake objections. Siphons take suction from 50 ft. offshore and discharge into pump-house fore-

Separation of Fine Iron Ore by Cyclone Action

Tests conducted in a continuous pilot plant of the Hanna Ore Mining Co. were directed at finding a workable process for handling iron ores in the size fractions ⅜-in. down through 65 mesh.

The main unit was a Dutch State Mines cyclone separator. This is a dynamic separator multiplying gravity and increasing the specific gravity differences of mineral particles. Separation is effected by centrifugal and centripetal forces in the cone-shaped section of the unit.

The ore to be treated is suspended in a magnetite medium and water. The fine ore is floated out an overflow.

System consisted of an ore flow and a medium flow. All products were washed and the medium recovered by magnetic separators. Total medium usually consisted of 50% drained and 50% cleaned.

The feed ore was screened through a ⅜-in. square screen and washed in a primary rake classifier. Average feed ore rate was 6 dry long tons per hr.—Engrg & Min J, Jun, p71

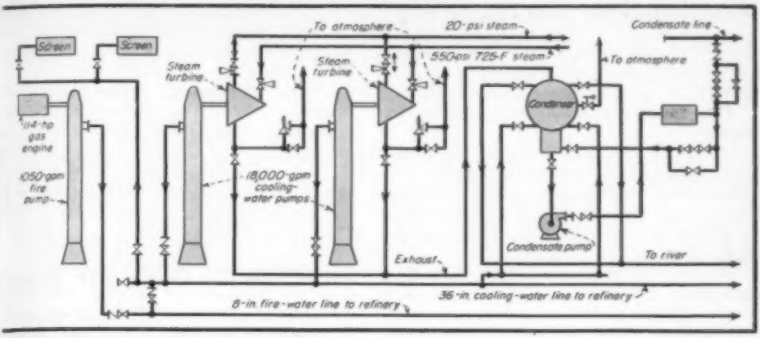
Filling Winder on Loom

Single-head automatic filling winder is designed for mounting directly on single-shuttle looms. Unit takes less floor space; permits elimination of filling rooms; only 11 quills per loom are needed; quills are wound to loom requirements; it is suitable for single-shuttle work only.

Developed by Universal Winding Co., the filling winder performs the following operations automatically: filling bobbins are wound and magazined; bobbins ejected are stripped; empty bobbins are transferred to winder head; filling-yarn supply is transferred from spent to new package if tails are available.

Winder is designed to run 10-20% faster than filling is used by loom.—Textile World, June, p137

. . . Pulls Water with Siphon Intakes



bay. Refinery cooling water at 50 psi. is pumped with two 18,000-gpm. vertical high-lift pumps driven at 800 rpm. by 650-hp., 3,600-rpm. steam turbines through right-angle speed reducers. Turbines exhaust to 20-psi. process line, surface condenser, or both. Single 1,340-sq. ft. condenser serves both turbines. Condenser cooling water is taken from refinery line and discharged to the river.—Power, June, p100

Depth, Shape, and Color To Dominate Ceramic Design

Design changes in ceramics are rapid. One idea that bears watching is the third dimension in flat surfaces. The new floral and geometric designs on dinnerware have great depth.

Shape too will change. In the past, accepted shapes have been based on the material available and the function. But a new list of materials lend themselves to almost any shape.

Wide departure from standard shapes will bring shapes into line, not only with one function but also with multi-purpose use. An example—the cooking range will tend to go into the wall, leaving only burners on a retractable work surface.

Another idea involves the simplicity in cleaning. A present drawback is the common concept that ceramic surfaces need be shiny. Texture will be important in tomorrow's design—in exterior ceramic finishes, interior finishes, and product finishes covering lamps, pottery, appliances, hollow ware, dinner ware.

Color treatments will be outstanding. More designers are using color as a unified effect. Color will move in cycles. From the predominant strong-color period now becoming evident, the cycle will change again into pastels and on back to strong colors.—Ceramic Ind, June, p56

Air Packaging is Tested

Special packaging problems are being answered by a research program conducted by the Packaging Branch, Materials Laboratory, Wright-Patterson Field, AFB. Particular interest is attached to "dangerous" items such as acids, ether, cleaning fluid, and some photographic material.

Package test chamber can undergo an altitude change from sea level to 50,000 ft. in 3 min.; temperature change from 165° to -65° F.; vibration cycles range from 600 to 3,600 per min.—Aviation Wk, May 29, p34

Frozen Concentrated Milk Exciting, But Not Yet Ready

Problems presented here will bring you up to date on frozen concentrated milk and give you a basis for evaluating further progress. Most obstinate troubles are:

Avoiding the cooked flavor when pasteurizing and concentrating the milk and preventing chalky flavors from developing during frozen storage. Pasteurizing temperatures and holding times are being explored.

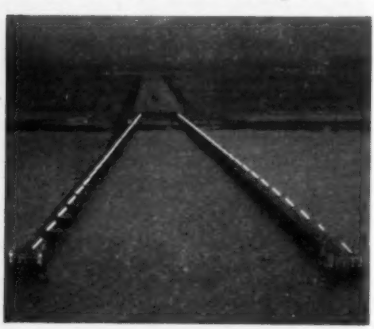
Getting the proper concentration. Milk has been concentrated and frozen on a basis of 2½ to 1. At 3 to 1, it breaks down in storage, does not reconstitute properly.

Preventing breakdown in storage. Protein stability deteriorates, and milk tends to separate into curds and whey when thawed. How to prevent: flash heating, adding certain salts, extremely fast freezing, not concentrating to high solids.

Simple reconstitution. A method must be found that is easy for consumer. One way is slow thawing in the refrigerator, then adding tap water.

Proper packaging. Dairy people are thinking of a ½-qt. container of tin, fiber, or paper. Newly developed liners look promising.

When will it be ready for market? General consensus is that no truly final conclusions will be reached for at least 1½ years.—Food Ind, June, p39



LIGHTS TO LAND

Instrument-landing runway at New York International Airport is equipped with Type BL "Slope Line" approach lights. System consists of two rows of units installed on 2,000-ft. piers extending over the water. Each unit has 10 Sealed Beam lamps mounted in a box 14 ft. long at a vertical angle of 45°. When airplane is on right path, two lines of light appear as uninterrupted lines.—Elec C&M, June p47

Stop Streaky Dyeing in Blends

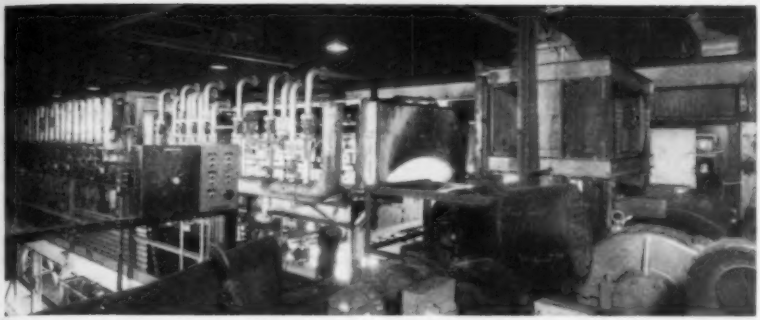
To determine how much blend variation is necessary to cause dye bands, American Viscose Corp. made a series of tests using 1.5-denier, 1⅜-in. dull Avisco dull staple and 3.0-den., 1½-in. dull acetate. Blends varied from 50%-50% to 54%-46%, heavy on the viscose.

Engineers found that: (1) A variation of 3% in content will make fabric unacceptable. (2) Pad-dyeing techniques reduce unlevel dyeing caused by blend variations. (3) Use of box looms to mix filling is a good idea. (4) Unlevel dyeing can be reduced by plying yarns and by lot mixtures.—Textile World, May, p86

Grout RR-Highway Crossings

Railroad and highway crossings along the Norfolk & Western route are all grouted ballast areas with preframed and prebored treated-timber flange ways and welded rail. Roads are surfaced with bitumen.

Structure is built on a grouted, stone-ballast base. Ties are new. Tie plates and welded rails are placed and more ballast is added to within 1 in. of the top of the ties. Grout is added after a day of settling. Grout is 1 part cement, 2 parts brick sand, and 8–10 gal. of water per sack of cement.—Railway Engrg & Maint, May, p458



OXIDIZING FURNACE in foreground has feeding pinch rolls and strip tension device at right and is followed at left by the reducing furnace

Galvanizing Process Revealed

Continuous galvanizing substitutes oxidation and reduction for pickling, results in coating of remarkable product uniformity

SECRET FOR 14 YEARS, the Sendzimir process for continuous galvanizing of iron and steel has now been revealed by Armco Steel Corp.

In the Sendzimir process, surface preparation of the base metal is accomplished in two steps—oxidation of the surface and subsequent reduction of the oxidized surface. Preferred method of oxidation is by heating in an oxidizing medium. Not only is the surface oxidized to the same degree each time, but also rolling lubricants and other combustible material burn off.

Reduction of the oxidized surface is usually combined with heat treatment of the base metal. The full-hard, cold-reduced material is annealed at the same time the reduction takes place. The reduction is controlled by composition of furnace atmosphere and furnace temperature.

In the actual galvanizing operation, the major problem is to suppress the formation of brittle iron-zinc compounds in the coating. These alloys reduce the ductility of the coating. Formation rate is controlled by adding aluminum to the zinc bath and regulating properly the temperature of the material being coated.

Iron or steel strip to be galvanized is fed into the coating line at a constant speed under specified tension. This tension must be sufficient to guide the strip through the various line units but not so great as to stretch or break the strip.

The strip must be preheated uniformly in a furnace preferably equipped with an adjustable firing pattern so all widths can be uniformly oxidized. High-temperature, direct-firing gas burners work well in the preheat furnace.

The annealing furnace, next in line, completes heating of the strip under a reducing atmosphere. Burners should not be of the open-flame type.

The cooling furnace is connected directly to the annealing furnace and extends to the zinc bath. Its end is sealed by molten zinc. It controls cooling rate in a non-oxidinging atmosphere and has automatic heating and cooling means to

compensate for variable quantities of heat in strip of different widths. The strip must reach the zinc bath at the proper temperature for instantaneous wetting and bonding with the zinc.

Zinc-bath temperature is maintained at 850°-860° F. Temperature fluctuations must be avoided to prevent dross formation. Drossing is usually necessary only every 10-12 weeks.

One limitation of the process is that it cannot be used to coat cut length sheets and formed articles. Neither is it satisfacory for coating highly alloyed materials or severly scaled surfaced without additional pretreatment.—Iron Age, June 8, p71

Positioning at Workplace Important in Handling

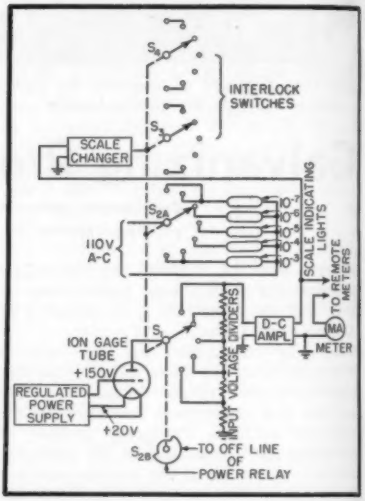
Positioning at workplace has long been overlooked by materials-handling personnel. Because it has long been overlooked, the field offers great potential savings in man-hours. The job of the positioning equipment is to minimize tiring, costly manual handling at machine or workplace. With positioning equipment, the job is done faster, with less fatigue, and with greater safety.

At Carrier Corp., a study was made of handling of 50-million lb. of steel in press, machining, welding, and assembly departments. Savings that resulted after installation of the positioning equipment were:

- Shear tables cut 30% of time shear men spent on materials handling.
- Pallet elevating tables cut 28% of handling time of pressmen.
- Accordion and wheel conveyors cut 20% off time positioning stampings for next operation.
- Mechanized line positioners eliminated up to 50% of time required for manual handling of bulky assemblies.
- Welding positioners cut 30% off welder's manual positioning time.—Factory, June, p96

Coal Dredged from River

Guyan River Co. is dredging 20,000 tons of high-quality egg and nut-slack sized coal from the Guyandotte River, the coal being a by-product in dredging for sand. Source of coal is gob piles along the river and its tributaries. In its 40-60 mi. travel to dredging area, coal has been laundered naturally. New supply comes each flood.—Coal Age, June p84



AUTOMATIC HIGH-VACUUM CONTROL

This accessory circuit will automatically show the magnitude of high-vacuum systems when used with an ionization gage. Voltages and currents applied to the ion-gage tube are electronically regulated. Pressure is determined from logarithmic scale calibrated in millimeters of mercury and a system of indicating lights showing an appropriate multiplier ranging from x10⁻⁷ to x10⁻³. An automatic scale-changing mechanism acts to adjust sensitivity of indicator to keep meter reading between 6-100% of full scale. Indicator unit is essentially a microammeter with one millivolt drop and maximum full-scale sensitivity of 0.1 microamp.—Electronics, June, p108

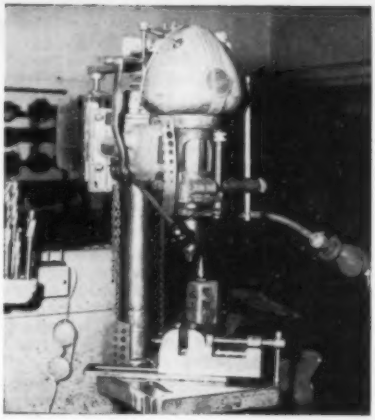
Universal Drafting System Handles 1- to 9-in. Fibers

Cotton or worsted spinning mills, formerly limited in fibers handled and counts produced, are transformed into fiber-converting mills by Collins & Aikman Co.'s new spinning process. Fibers from 1-9 in. long can be handled. System can make almost any medium count of worsted yarn on a cotton-carded yarn system.

Plants are producing medium-count worsted-type yarns—4s to 40s—suitable for general-purpose fabrics. System uses conventional cotton machinery through carding. Drawing is slightly modified for long fibers. Roving is considerably modified. For long fibers, spinning too must be modified.

Roving frame will take worsted top, tops of scoured wool, or hair fibers that can be carded on a cotton card and combed on a French or Noble comb.

The company contemplates licensing mills to use the process.—Textile World, June, p89



DRILL PRESS CHANGES SPEED

Drill diameter determines speed of rotation, so Central Electric Co., Boston, rigged this drill press for easy speed selection. Curved and slotted guide for motor control lever has various size holes drilled opposite each slot. Operator need only to match drill size with hole size and then set control lever in the corresponding slot.—Elec C&M, May, p70

Pneumatic Concrete Homes

Home construction costs can be cut 50 cents per sq. ft. below conventional wood frame and stucco houses. Martin Gunite Homes, Inc., is doing it. Company says use of pneumatically-applied gunite saves through increased construction speeds. The company is building 180 such houses, completing one per day.

Schedule runs as follows: 1st Day—Footing trenches dug. 2nd Day—Rough plumbing and electrical work. 3rd Day—Footing and floor slabs. 4th Day—Wall forms built and placed. 5th Day—Reinforced steel for walls prepared. 6th-7th Day—Steel placed in forms. 8th Day—Exterior and interior walls shot into place with Gunite.

9th Day—Form panels stripped from walls. 10th Day—Exterior and interior walls sprayed with color. 11th Day—Beams and preliminary roofing placed; windows glazed. 12th Day—Built-up roof installed. 13th-14th Day—Exterior and interior trim bath and kitchen enamel coated. 15th Day—Hardware and heating installed.—Amer Builder, June, p107

New Pest Weapon Made

Allethrin, a clear brownish liquid, is a bug killer. Practically as good as pyrethrum, it is the allyl homolog of Cinerin I. But more exciting, it is now synthesized commercially by Union Carbide & Carbon Corp. Processing is complex. Twelve different steps are involved, and 11 different intermediates are processed. To make 1 lb. of allethrin, almost 200 lb. of about 25 different chemicals are handled.—Chem Eng, June, p111

New Products

Electron Microscope — Useful magnifications up to 50,000 diameters are possible with new EMP type table-model permanent-magnet electron microscope. Stabilization circuits and controls are eliminated with permanent-magnet lenses. It features resolving power to 100 angstrom units.—**Radio Corporation of America**—Electronics, June, p126

Cupola Hot Blast—Hot-blast system takes cold air from present blower, passes it through oil- or gas-fired air heaters, delivers it to cupola at 450° F. System can be quickly installed without interrupting melting schedule.—**J. O. Ross Engrg. Corp.**—Foundry, May, p294

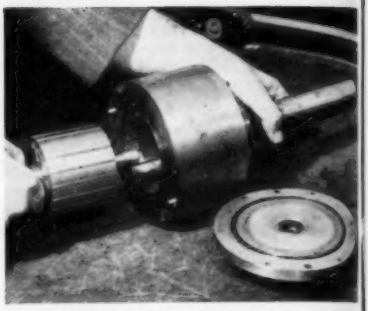
Sterilizes Liquids—Rapid sterilization of water and other liquids is done without heat or chemicals by the Steritron. Device employs ultraviolet source of high intensity. Models are for 110, 220, and 440 v. and 25, 50, and 60 c.—**Hanovia Chemical & Mfg. Co.**—Food Ind, May, p133

Heat Insulation — Mirror-heat insulation consists of several layers of aluminum-alloy sheets mechanically held by nonconducting spacers to surface being insulated. Maker claims heat loss to be less than with same thickness of standard insulations.—**Gronemeyer Corp.**—Power, May, p144

Controls D-c. Welders—Controls of d-c. arc welder driven by ac. are transferred to electrode holder by remote-control device. It can start and stop machine, select polarity, and regulate current. — **Foster Transformer Co.**—Elec World, June 5, p132

Improves Shaver Efficiency—Efficiency of electric shavers is raised up to 80% by a transformer plugged into wall socket. Shaver cord is plugged into transformer. —**Electronic Specialty Co.**—Mod Plastics, June, p83

Electric Timing—Developed originally as a clock movement, timing device serves as precision industrial timer. It is powered by flashlight battery, but accuracy depends on hairspring and escapement, not on battery charge. Size is 2⅜x1½x1⅛ in.—**El Products Corp.**—Prod Eng, May, p164



NEW CLUTCH PACKS POWER

Still in the laboratory stage is this improved magnetic fluid clutch built by General Electric Co. Basic feature is a mixture of oil and finely divided iron powder that is contained between the two cylinders. Energizing the unit causes this mixture to solidify and transmit motion. Degree of rigidity is controlled by varying energizing current.—Engr & Min J, May, p123

Power Plane—Model 101 Guild plane has interchangeable motor that also can be used on Guild router. Maximum cutting width is 1 13/16 in., weight is 8 lb., speed is 20,000 rpm. Plane can be converted to shaper-jointer or portable moulding plane. —**Porter-Cable Machine Co.**—Am Builder, May, p64

Package Boiler—Model LR self-contained boiler features ready change-over from heavy oil to industrial gas fuel. Boiler is four-pass fire-tube type, having rotary burner and single blower.—**Cleaver-Brooks Co.**—Chem Eng, May, p172

Lightweight Conveyor—Aluminum gravity conveyor adapted to outdoor installation is available in sections of 5, 8 and 10 ft. and in widths of 12 and 18 in. It is nonsparking and free from corrosion. Smallest section will support over 1,000 lbs. Rollers are offered in four spacings.—**Rapid-Standards Co., Inc.**—Steel, May 29, p85

Combination Properties—New commercial metal-ceramic, called Metamic LT-1, combines 70% aluminum-oxide ceramic with 30% powdered chromium. Thermal conductivity and shock resistance are increased by chromium, while the ceramic resists high-stress, high-temperature deformation. Products are fabricated by powder metallurgy.—**Haynes Stellite Div., Union Carbide and Carbon Corp.**—Prod Eng, June, p168

Load Stabilizer—Designed for soft-drink industries, a load-stabilizing attachment for fork-lift trucks steadies wobbly, multi-layer pallet loads. Flat, rubber-covered plate presses load from top. Double-acting hydraulic cylinder raises and lowers plate.—**Towmotor Corp.**—Factory, June, p154

Small Hand Torch—Minor metal heating jobs can be easily done with a new self-contained, lightweight hand blowtorch. Safe enough for home use, a special fuel ignites instantly, gives a clean blue flame (more than 2,200° F.). Pint-sized fuel container can be replaced in 30 sec.—**Pressure Products Corp.**—Fleet Owner, June, p63

Jet-fuel Resistor—Solvent-resistant rubber compound, called Aero-Sealz, can be mixed with tar pavement and expansion joints of runways to inhibit dissolving effect of kerosene-type jet fuels. Normal spillage creates hazard for planes by disintegrating runway surfaces.—**U. S. Rubber Co.**—Aviation Wk, June 12, p33

Plug Valves—Non-lubricated, leak-proof cylindrical plug valves are suitable for steam, fuel oils, caustic solutions, viscose, beer mash. Units are ½-6 in. Materials are high-tensile iron, bronze, stainless steel, Ni-resist Duriron, and others. Capacities are 150-300 psi.—**Minneapolis-Honeywell Regulator Co.**—Oper Eng, May, p68

Starts Motors—New starter is for motors on roving and spinning frames in textile mills. Motor is started at slow speed by resistor in motor circuit. Resistor is then cut out to apply full voltage. Thirty resistor taps allow adjustment of starting torque.—**Cutler-Hammer, Inc.**—Elec C&M, June, p112

Gas-butane Diesel—Model LI-600 diesel engine has gas-butane operating equipment. It can deliver 280 hp. burning 1,000-Btu. butane or 78-octane gas. Bore is 7 in., stroke 10 in., engine weight 10,400 lb.—**Cummins Engine Co., Inc.**—Oil & Gas J, June 8, p90

Tensiometer Uses Two Gages—Two strain gages mounted on a flexible arm measure and record deflection of arm caused by tension in winding, spooling, quilling, and other operations.—**American Viscose Corp.**—Textile World, June, p140

Mechanical Float Finisher—Dense, wear-resistant slab, free of riffles and depressions, is produced by a mechanical concrete finisher. Float is done with flat float trowels. In finishing, trowels are replaced by tool-steel finish trowels. Trowel pitch is controlled from handle. Either gasoline or electric motors are available.—**Whitman Mfg. Co.**—Cons Meth & Equip, May, p109

DEGREASES STEEL

Two banks of nine vertical 3.6-kw. radiant heaters degrease sheet-steel parts at Lawson Mfg. Co. Continuous conveyor carries parts through infrared oven. No oil remains after 36-sec. trip. Each bank of heaters, made by Edwin L. Wiegand Co., has one unit at 45° to increase heat on bottom of work.—Steel, Apr 10, p92

New Products (Cont.)

SPEEDS LAYING OF ROOFING

Laying of asphalt shingles or other roofing materials is speeded with Bostitch's heavy-duty automatic stapling hammer. The 2¼-lb. hammer drives staples having ½-in. crown and ¾-in. leg. Legs diverge inside work. One blow drives staple all the way home.—Eng News-Rec, June 15, p111

Penscope—You can check distant meters, dials, stock piles while you sit at your desk with a six-power telescope. Only 5 in. long and 2 oz. in weight, it offers a field of view 315 ft. at 1,000 yd.—**Pan-technics, Ltd.**—Oil & Gas J, May 25, p165

Dry Fluid Cooler—Designed to save water, cooler consists of propeller fan and heat exchanger mounted in one casing. Fan blows air across coils to cool engine-jacket water, lube oil, transformer oil, similar fluids.—**Trane Co.**—Oper Eng, June, p69

Openside Shapers—Hy-Draulic openside shapers have stroke lengths of 48, 60, and 72 in. Work table is a box section supported by double-length bed. Column supports heavy cross-rail. Drive is hydraulic. —**Rockford Machine Tool Co.**—Iron Age, Apr 27, p38

Jig Borer Positions Itself—Setting of jig-borer table is reduced by automatic positioning on model 42P. Measuring rods are placed in table trough. Positioning device rapid-traverses table to within 1/16 in. of position and then brings it to position within ± 0.0001 in. Machine capacity: table to spindle 27 in., spindle travel 9 in., head travel 12 in., table travel 42x18 in.—**Fosdick Machine Tool Co.**—Am Mach, May 29, p130

Plastic Packing—A non-jacketed, plastic packing is said to give long service, increased operating efficiency, and maintenance of an effective seal over a wide area of application. It has greater density than braided or woven packing, more resilience than die-formed packing. —**Raybestos-Manhattan Inc.**—Coal Age, June, p117

Recordo-Print Adaptor—Any Model A-2 Weber addressing machine may be equipped with a device that will address envelopes and other data direct from file cards or other office records. Adaptor takes seconds to install.—**Weber Addressing Machine Co.**—Railway Age, June 10, p51

Controls Electrical Load—Controlomax, a device to reduce peak load demands, is a thermally operated switch that opens controlled circuit supplying a deferable load whenever current exceeds a predetermined value. It may be connected in main service or branch circuit. Rating is 60 amp.—**Sangamo Electric Co.**—Elec West, May, p38

Boiler-feed Pump—Single-suction, double-case, barrel-type boiler-feed pump is designed for 250- to 1,200-psi. pressure range. Unit has back-to-back impellers and radially balanced double volutes in split inner casing. Pump is also suitable for other high-pressure applications.—**Allis-Chalmers Mfg. Co.**—Power, June, p182

Mold Blowing Machine—New unit, designed to handle 12x18-in. flasks on its circular turntable, produces 350 half molds per hr. Molding is done in station sequence of filling, squeezing, vibrating, and pattern removal. Two of five stations are always empty to allow cleaning and setting flasks.—**International Molding Machine Co.**—Foundry, June, p221

Multi-stop Delivery Trucks—New truck line features body having ample cargo space, inside height of 70 in., wide side doors to make loading and unloading easy. Silver Diamond 220 six-cylinder 100-hp. engine powers the trucks. Three body sizes available are 235, 292, and 375 cu. ft. —**International Harvester Co.**—Food Ind, June, p94

Subminiature Relays—Series SM subminiature relays are made for use with miniature socket and shield with inner spring. Power ratings up to 1.75 w. are offered and with d-c. windings from 0.155 to 8,000 ohms.—**Potter and Brumfield Mfg. Co., Inc.**—Electronics, June, p196

Vertical Centrifugal Pump—Designed for use where net positive suction head or installation space is limited, Hydro-Line pump is vertical, close-coupled turbine unit. Capacities run to 5,000 gpm. for heads up to 1,500 ft.—**Food Machinery & Chemical Corp.**—Chem Eng, June, p147

Midget Road Marker—High-speed, low-cost road marking is possible with a midget tractor equipped with marking attachments. Tank holds 5 gal. paint—enough to paint 5 mi. of highway. Paint is sprayed under pressure.—**Beaver Tractor Co., Inc.**—Eng News-Rec, June 15, p111

Drills Masonry—Round-shank drill bits for masonry, brick, tile, concrete, and similar materials are spirally wound with wire to remove chips and dust. Sizes are ¼-1 in. Bits can be used in any slow-speed rotary drill.—**Paine Co.**—Elec Whols, May, p92

Hydraulic Pump—Continuous-acting, air-operated hydraulic pump has built-in release valve to permit pressurized oil in cylinder to return to reservoir by gravity. Oil pressure of 1,000 psi. can be obtained with 90-psi. air.—**Lyon Raymond Corp.**—Paper Ind, May, p208

Hardness-scratch Tester—Surface toughness and scratch resistance of plastics or coated surfaces can now be checked in one operation. Finely balanced beam is scaled to 10 g. per graduation. Sliding weight varies load from 0-500 g. Variable 1,000-g. weight is available.—**Taber Instrument Corp.**—Mod Plastics, June, p120

UNBREAKABLE BOTTLE

Gallon-size container, made from polyethylene, was designed by Packaging Branch of U. S. Army Air Materiel Command. It eliminates the hazards involved in transporting acid by airplane in the usual glass bottles. —Prod Eng, June, p152

Air Compressors—Packaged-type, heavy-duty, electric-driven compressors range from 125-350 hp. for continuous load service and two-stage compression to 80-125 psi. discharge pressure. Low-pressure cylinder is vertical, high-pressure cylinder is horizontal.—**Ingersoll-Rand Co.**—Foundry, June, p220

Multi-purpose Grease—New industrial grease, Alvania, has high melting point, good resistance to heat and water, and excellent oxidation stability. It can replace sodium, calcium, aluminum and mixed-base greases. A big advantage is that less inventory is needed.—**Shell Oil Co.**—Ceramic Ind, June, p130

READER SERVICE

As a special service to our subscribers, McGraw-Hill Digest will furnish without any charge additional information about any new product or technical development described. Address your letter to: The Editor, the McGraw-Hill Digest, 330 West 42nd St., New York 18, N. Y., U. S. A. —*THE EDITORS*

• *WOOD PINNING is valuable where acid-water condition prevail*

Pin Coal Mine Roof With Wood

Oak or hickory roof pins are cheaper than steel, give good support, are not effected by acid water, need no special setting equipment

SOFT, STRATIFIED TOP, soaked by acid water percolating down from above, made use of steel roof bolts at Norton Coal Co. impractical. Pins are now wooden. They show a 20% cost saving over conventional crossbar ring and materials.

Wood was selected as pin material because it:

- Was cheap.
- Provided necessary strength in a convenient size.
- Would resist acid water, and would not decay if preservative were used on the exposed end.
- Needed less special equipment for installation.

After being used for 2 years, other advantages have appeared. If the pin fits hole snugly, it bonds to the strata for its entire length, giving better locking action. With a tight pin, spalling of roof at bottom does not destroy pin's effectiveness. Necessity of slacking sides of holes is eliminated.

Pins are made in the mine shops from high-grade oak or hickory, well seasoned and cut with the grain. Stock is 3 in. square, turned to a diameter of 2⅜ in. A 4-in. length is left square at one end. Length is 5½ ft. Fifty pins are turned per hr. at a cost of 16¢ each. Treating is by brush or dip. Exposed ends of pins are specially treated to reduce fungus attack.

A square socket on the end of a drill threadbar is used to place pins. Holes are drilled with standard drills. The 2⅜- to 3-in. holes are drilled at as high an angle as possible. Practice is to drill two rows of holes per cut, three holes against the face and two holes 4 ft. back.

Pins also support 2 x 10-in. or larger crossbar planks at turnouts or places where the top is unusually bad.—Coal Age, June, p78

Finger-Plan for School Saves Both Light, Heat

Finger-plan layout of a Minnesota elementary school was constructed for $0.81 per cu. ft. Layout has resulted in unexpected savings in light and heat.

Three classroom fingers provide six classrooms each. The "hand" portion of the structure provides a library, offices, health area, toilet and service facilities, kitchen, and a combination cafeteria-auditorium-gymnasium. Total cost, including well, septic tank, and sanitary facilities, was $416,328.

Foundation walls of concrete block sit in trenches. Concrete floor slab has asphalt top. Above grade structure is light steel frame with brick exterior. Window frames are wood. Heating system is a combination warm air-radiant heating system. Heating the entire 38,300 sq. ft. on an average winter day costs $5.00—Eng News-Rec, June 15, p37

Uniform Oiling, Tinting

A new method of applying tints to fibers to improve fugitivity and for applying oils to fibers has been developed by Bachmann Uxbridge Worsted Corp. The system applies oil and tint evenly, assuring longer pin life, less cleaning, less brush waste, less lapping on rolls, and better subsequent processing.

Oil or tint is applied by low-pressure nozzle in front of pin drafter. Spray covers web in oiling chamber, which folds in oil or tint as fiber leaves unit. Atomizing is done at 5-lb. maximum air pressure.—Textile World, June, p101

Test Gas-Turbine Truck

Preliminary road tests of Boeing Aircraft Co.'s lightweight turbine in a Kenworth truck have proved outstanding. The turbine (McG-H Digest, Mar, p27) has many less moving parts than a diesel engine.

The test truck is quieter than a conventional diesel truck, even without mufflers on the twin exhausts, which rise on each side of the cab. Exhaust gases are about the same temperature as those from a diesel, are virtually invisible (except for a puff at the start), and have no offensive odor.

The turbine burns two to three times as much fuel as a diesel engine. Heavier, cheaper grades are satisfactory, but fuel consumption must be reduced for economical commercial operation.—Am Mach, May 1, p128

Glass Ground Faster

Glass grinding at Tayloe Glass Co., Inc., has been speeded up considerably by using a metal-faced platen. The new type of platen, which replaces leather-faced platens on the belt grinding machines, is a sandwich affair. It consists of a ¼-in. layer of sponge rubber between two metal plates. The new platens, besides increasing production and cutting grinding costs, also permit glass to be applied to the grinding belt with lighter pressure, resulting in greater precision in work.—Ceramic Ind, June, p87

MEN RISE WITH WORK

Loading 100-lb. bags of salt from conveyor to pallets is tiring, especially as pallet load rises. So Leslie Salt Co. uses an elevator platform. End of conveyor rests on the platform. As pile rises on pallet, elevator rises and the worker's relative position to work always remains the same. Maximum rise is 3½ ft.—Factory, June, p107

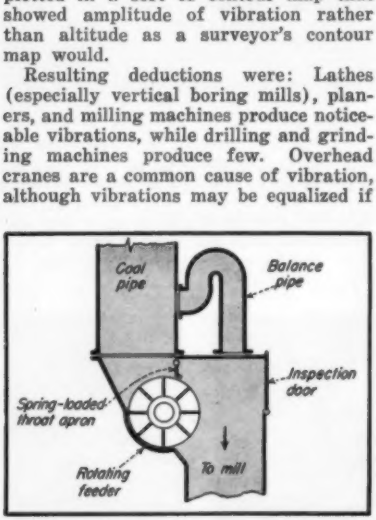
Machine-Shop Vibration Affects Product Finish

Vibrations can have a bad effect on surface finish produced by machine tools. They may originate from machine tools themselves, overhead cranes, industrial trucks, and other causes.

The vibrations can be measured in any shop. Engineers at the Karhula Shops in Finland, for example, divided the shop floor into 5-yd. squares and measured vertical components of vibration at each intersection. Measurements then were plotted in a sort of contour map that showed amplitude of vibration rather than altitude as a surveyor's contour map would.

Resulting deductions were: Lathes (especially vertical boring mills), planers, and milling machines produce noticeable vibrations, while drilling and grinding machines produce few. Overhead cranes are a common cause of vibration, although vibrations may be equalized if vibration phases for different cranes are running in opposite directions. Industrial trucks too are major offenders especially if the shop flooring is not tight.

These deductions helped to determine machine-tool rearrangement and to improve product quality.—Am Mach, May 29, p94



FEEDS COAL PULVERIZER

On coal pulverizers that operate best under negative pressure of about 2 in. of water, a balance pipe has certain advantages. Without pipe, fine coal leaks past spring-loaded throat apron unless negative pressure is removed. This would result in poorer pulverizer operation. But pressure can be removed across feeder by adding the balance pipe, thus preventing coal bypassing feeder and freely passing air.—Power, June, p126

Promising Molding Plastic

Bridging the gap between soft and hard rubbers, a new plastic promises to become a basic raw material of the rubber industry. The plastic is Enrup, made by United States Rubber Co.

Although the exact composition of Enrup has not been revealed, it is believed to be a blend of Buna-N and a phenolic resin, together with other modifiers.

Properties: light in weight, stable at high temperatures, tough, and resistant to abrasion, oils, solvents, acids, and mild alkalis. It is thermosetting. Its high dielectric strength makes it a good electrical insulator.

Applications include filter press plates, chemical buckets, textile lap rolls, photostat separator plates, fuel-pump parts, battery cases, plating barrels, bearings, and various automobile parts such as timing gears, distributor caps.—Chem Eng, June, p166

British Turbine Research

The British Admiralty has undertaken an extensive study of the heavy-fuel problem as applied to marine applications of the gas turbine. Common belief is that it will be virtually essential to use residual grades of fuel for gas turbines at sea.

Studies will include fuel characteristics, atomization, combustion, heat transfer, blade and heat exchanger fouling, and effect of impurities in residual fuel on the structure and properties of high-temperature materials.—Prod Eng, June, p148

Silicone-Carbide Briquettes Improve Iron Machinability

Thin-section gray-iron castings are susceptible to surface hardening. As a result, machinability is poor, more hardened metal has to be removed in finishing operations, and tool life is short.

Tests conducted at the Mellon Institute of Industrial Research have shown that machinability can be improved. The method is to use Ferrocarbo silicon-carbide briquettes in place of ferrosilicon briquettes as a cupola addition agent. Results: less surface hardening and more uniform structure.

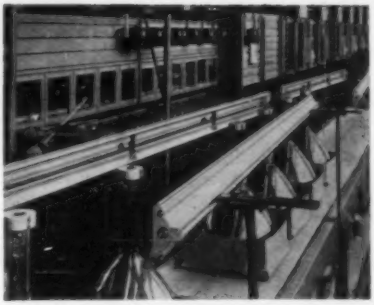
Tool-life tests indicated that Ferrocarbo-treated iron of high carbon equivalent (sum of total carbon and one-third of silicon content) gave considerably improved tool life. This was particularly true at higher cutting speeds.

Over the range of 200-300 sfpm., tool life was 50-100% greater than the average tool life with other irons tested. The Ferrocarbo iron of low carbon equivalent gave somewhat variable results.—Iron Age, June 1, p73

Drills Wells with Tubing

To reduce oil-well drilling costs, Shell Oil Co. undertook a study of slim-hole drilling. Circulating rates and pressures, mud flush, rising velocity, and availability of suitable side-wall sampling, fishing, and testing tools were considered in trying to determine the best hole and drill-pipe sizes.

Nine wells have been drilled with 4½-in. O.D., 9.4-lb., 0.205-in. wall steel tubing. Depths ranged from 3,650 to 6,150 ft. Results to date have been satisfactory. For a group of four wells drilled to a depth of 3,300 ft., average time for tubing-drilled wells was 8½ days. Comparable conventionally drilled wells reached this depth in 9 days.—Oil & Gas J, June 1, p54



DRIES TV TUBE CEMENT

Eight 230-v., 3,600-w. radiant heaters, mounted over conveyor belt carrying television picture tubes, dry the cement that seals tube ends. Installed at National Radio Products Co., the heaters supply enough infrared heat to polymerize the cement and yet give no glare to annoy workers.—Elec World, June 5, p128

Avoids Industrial Pollution

Chevrolet-Flint Mfg. Division of General Motors Corp. has managed to remove emulsified oil from waste water and thereby to avoid stream pollution.

The waste contained various cleaners and other chemicals along with the soluble oils. The process as finally worked out consists of:

1. Rapid mixing (25 min.) of waste with aluminum sulphate or ferric chloride.
2. Separation of components of broken emulsion by prolonged sedimentation and oil skimming (3 hr.).
3. Rapid mixing (9 min.) with an alkali to precipitate coagulant.
4. Slow agitation (1¼ hr.) of suspended hydroxide for coagulation.
5. Prolonged sedimentation (3–7 hr.) to separate oil-bearing hydroxide from clarified water.

The plant operates in the range of 10,000–12,000 gph. Results are satisfactory.—Steel, May 22, p97

Proper Care Will Reduce Hollow Steel Drill Cost

Proper care in forging and handling hollow steel drills will increase their life many times.

Improper drilling is responsible for a high breakage rate per foot of hole—bad alignment of air hammer, loose or sloppy machine setup, and improper feed pressure. Off-center blows produce high stress concentrations and subsequent failure.

Worn machine parts are also responsible for drill breakage. Improper chucks cause excess wear and are soon wrong for correct drill rods. Systematic inspection and repair of drills and machines will reduce these failures.

Incorrect hammer air pressure will cause either too much vibration or too much energy to be absorbed by drill. Dents or tool marks on the surface of the drill prevent even stress distribution.

Most failures in collared or lugged shanks can be traced to improper forging or heat-treat. For best heat-treat, avoid a sharp line between hardened and unhardened zones after quenching. A frequent cause of failures in forging is splitting by using too large a punch. Sizing operations may also lap in the wing tips and make them unsound. They lose their gage rapidly.

Best hardness and structure for machining is obtained by slow cooling from forging temperature by embedment in mica, ground asbestos, or similar material.—Engrg & Min J, June, p74

Side-Dump Pulp Wood Cars

Development of specially designed cars and car dumper has saved the Maine paper industry much money in its pulpwood handling. Cars are open-hearth steel, all bars, plates, and shapes ¼ in. thick or less. Cars are riveted, some subassemblies being welded.

Dumper consists of two 8½-ft. long platforms hinged to tilt to a maximum of 39°. Platforms are controlled by a hydraulic cylinder. Car is run onto platform and held to rails by locking bars attached to lugs on sides of car. Locking bars are hinged to a jaw on the end of the piston of two holding-down cylinders secured to the dumper platform.—Railway Age, May 6, p34

Void-Free Laminate Radome

Goodyear Aircraft Corp. has developed a void-free Neoprene-coated laminate for airplane radomes, which is more resistant to erosion and has better physical properties than materials now used. The void-free laminate improves erosion resistance 8-20 times.

Physical strength is improved 27-85%; surface is non-soiling.—Aviation Wk, June 5, p21

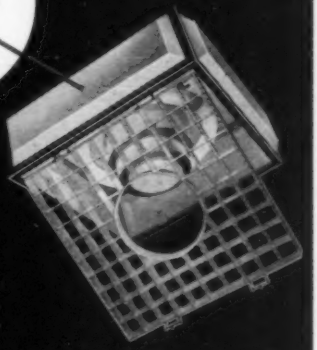
AUGER BORES UNDERGROUND

Boring under sidewalks, roads, and other obstructions to electrical distribution lines is now four times faster for Toledo Edison Co. This 6-in. auger and earth borer, powered by 5-hp. air motor, has replaced hydraulic pipe pusher formerly used.—Elec World, June 5, p114

STYRON

THE PREFERRED PLASTIC

gives high functional value



Styron was used for this new lighting installation.
Its lightweight feature permitted a much larger installation than would be possible with heavier materials.
Its excellent light stability helped solve the problem of fading or discolouring in the plastics panel or louver.
Its ease of mouldability allowed the 16" square louver to be designed in one piece, reducing costly assembling.

Lightweight Styron with its excellent light and dimensional stability gives high functional value to this new lighting fixture. In hundreds of applications Styron (Dow polystyrene) has reduced production costs at the same time lending added sales to the product.

Have you considered Styron for your product? It may be the ideal material to bring new life and lower production costs to your line of products. Contact Dow today for assistance in using Styron, the preferred plastic.

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1. The United States. Ebasco is helping firms throughout the country solve problems of costs, production, expansion, corporate finance, etc.
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3. Hawaiian Islands. Ebasco engineered and constructed an important gas plant extension in Honolulu.
4. Venezuela. Ebasco made a study and report on the development of an industrial community for a petroleum company.
5. China. Ebasco has designed and constructed a large steam electric station and other utility facilities in Shanghai.
6. Siam. Ebasco made survey and report for development of hydro-electric power.
7. India. Ebasco made an appraisal of Bombay transportation system, purchased trolley cars in U. S. and handled shipment to Bombay.
8. Germany. Ebasco made appraisals of industrial properties in American Zone for reparation purposes.

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Production Ideas

from Manufacturers' Catalogs

8-1 Speed Production—Ingersoll-Rand Co. 22p. Advantages of air power for industrial application is cited in a small booklet. Case histories explain money-saving ideas.

8-2 Welding Machines—Airco Co. International 36p. Catalog 8 describes portable arc welders in all sizes for both a-c. and d-c. welding.

8-3 Instruments—The Foxboro Co. 16p. Description of industrial indicators, recorders, controllers, pyrometers, and electronic instruments is found in catalog 370-1.

8-4 Automatic Wrapper—Package Machinery Co. Literature (about 60p.) explains uses and benefits of attractively wrapping packages to increase production and sales.

8-5 Cut Welding Time—Grinnell Co., Inc. 88p. A complete list of welding fittings and flanges with specifications is offered in catalog WF-1950.

8-6 Heavy-duty Trucks—Mack Mfg. Corp. 58p. Heavy-duty trucks for use in mines and quarries, oil fields, timber and pulp industries, construction, dairy and bottling industries pictured and described.

8-7 Office Equipment — Underwood Corp. 176p. File-folder "Underwood Products Speed the World's Business" gives details of the company's complete line of business equipment.

8-8 Choose Your Valve—Reading-Pratt & Cady Div., American Chain & Cable Co., Inc. 183p. A thoroughly complete listing of bronze, iron, and steel valves is offered in book-bound catalog 9.

8-9 Styrene—Dow Chemical Co. 194p. Good reference material for styrene monomer, a base plastic used to make polystyrene and styrene, is offered in a series of five bulletins. They deal with the chemistry, physical properties, handling, analytical methods and techniques for this much-used hydrocarbon.

8-10 Textile Machinery—H & B American Machine Co. 17p. Complete line of textile equipment for all operations from opening to twisting illustrated. Special bulletin describes high-draft spinning system.

8-11 Grinding—Norton Co. 162p. Extremely comprehensive handbook treats care and sharpening of shop tools plus a full line of abrasives and grinding machines.

8-12 Conveyors — Mathews Conveyor Co. 32p. Illustrated bulletin 848 shows industrial installations of all types of conveyor systems.

8-13 Portable Power—D. W. Onan & Sons, Inc. 20p. Bulletins describe complete line of a-c. and d-c. generators; diesel-electric plants; a-c. and d-c. stationary, portable, and stand-by electric plants; and the "Portaweld," 150-amp. portable welder.

8-14 Pumps—De Laval Steam Turbine Co. 28p. Specifications and applications of single-stage centrifugal pumps are shown in catalog 83-29R.

8-15 Heavy-duty Diesel—Nordberg Mfg. Co. 24p. Bulletin 176 describes FSM-16 four-cycle, direct reversing, 16-in. marine diesel, built in 6, 7, and 8 cylinder sizes of 16-in. bore and 22-in. stroke. Bulletin 172 describes company's oil and gas burning radial diesel.

8-16 Tube Cleaners—Elliott Co. 28p. Various applications of standard tube-cleaning equipment plus a full line of accessories shown in bulletin Y-29.

8-17 Belt Conveyors — Barber-Greene Co. 40p. Catalog RF shows all applications of new Redi-Fab permanent belt conveyors. Selection and layout can be made direct from catalog.

8-18 Polystyrene—Koppers Co., Inc. 4p. Literature discusses electrical, mechanical, and physical properties of six types of this plastic.

8-19 Less Payroll Work—Burroughs Adding Machine Co. 14p. Two folders illustrate suggested methods for writing related payroll records in one operation.

8-20 Toolroom Machines—Sheldon Machine Co., Inc. 16p. Catalog G-48 covers precision lathes, shapers, and milling machines, plus related accessories.

8-21 Belt Fasteners—Armstrong-Bray & Co. 12p. Literature illustrates fasteners and repair plates for conveyor belts. Also a full line of wheel pullers.

8-22 Wire Slings—Bethlehem Steel Export

Production Ideas (Cont.)

Corp. 16p. All types of wire slings and fittings are described in booklet 281.

8-23 Fast Movers—Ross Carrier Co. 32p. Details and specifications on complete line of straddle carriers and fork lift trucks are offered in illustrated bulletins C and LT.

8-24 "Cordura"—Rayon Div., E. I. du Pont de Nemours & Co., Inc. 10p. Booklet A-319 describes a high tenacity industrial rayon fiber used for paper, tires, belts, hose.

8-25 Lubricating Equipment—Lincoln Engineering Co. 64p. Folder describes complete line of pumps, fittings, guns, and accessories for large and small lubricating jobs.

8-26 Mercury Cell—Chemical Plants Div., Blaw-Knox Construction Co. 28p. Manufacture of chlorine, caustic soda, and caustic potash, using the Mathieson mercury-cell process, explained in illustrated bulletin 2261.

8-27 Safety Equipment—American Optical Co. 66p. Safety catalog shows full line of eye protection goggles, respirators, safety clothing, and miscellaneous equipment.

8-28 Solvent Extraction Equipment—V. D. Anderson Co. 12p. Complete description plus flow sheet of a complete packaged outdoor solvent extraction plant given.

8-29 Acid Handling, Adhesives — Monsanto Chemical Co. 22p. Procedures for handling 75% phosphoric acid in tank car lots given. Second pamphlet describes current practices in use of isocyanate-based adhesives.

8-30 Stop Vibration — Fabreeka Products Co., Inc. 36p. Bulletin explains use of new material used to mount machinery.

8-31 Maintenance Information — American Bosch Corp. 35p. Detailed bulletin gives maintenance information for fuel supply and injector pumps, mechanical and air governors, nozzles, and fuel oil filters.

8-32 Electronics—Raytheon Mfg. Co. 8p. Catalog illustrates commercial marine radar, radio equipment, precipitators, magnetic components, and all types of tubes.

8-33 Diesel Power—Fairbanks, Morse & Co. 16p. Wide range of diesel engines for marine, stationary, and generating service is described in detail in publication AOB490.1.

8-34 Cyanidation—American Cyanamid Co. 40p. "Mineral Dressing Notes, No. 17" treat the field of cyanidation in various ore samples, mill solutions, and precious metal precipitates.

8-35 Oil Business—Lummus Co. 80p. "Petroleum Horizons" is for all those technically interested in processing crude oil. Shows layouts and machinery for all processes.

8-36 Moderately Priced Resins — American Polymer Corp. 32p. Technical bulletin P-16 reviews the types, properties, uses, and methods of handling polyvinyl acetate dispersions.

8-37 Belt Conveyors—Jeffrey Manufacturing Co. 160p. Very thorough presentation of belt conveyors and related accessories is offered in catalog 785.

8-38 Treating Water — Worthington Pump and Machinery Corp. 16p. Bulletin W-212-B5 explains in detail a cold-process, slurry-type, precipitating water softener and coagulator.

8-39 Colored Plastics—Plaskon Div., Libbey-Owens-Ford Glass Co. 12p. Booklet MC-1 gives a concise and pictorial explanation of what is offered in colored plastics.

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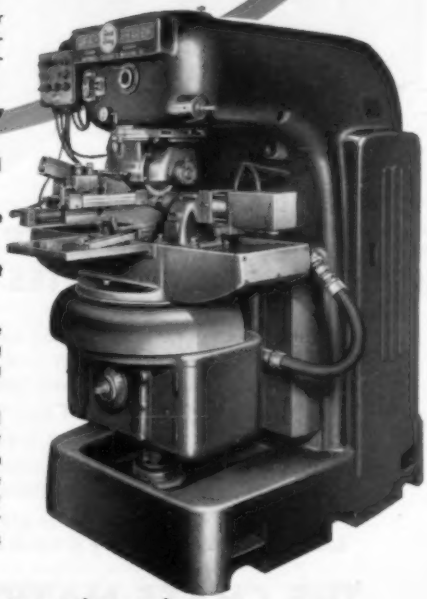

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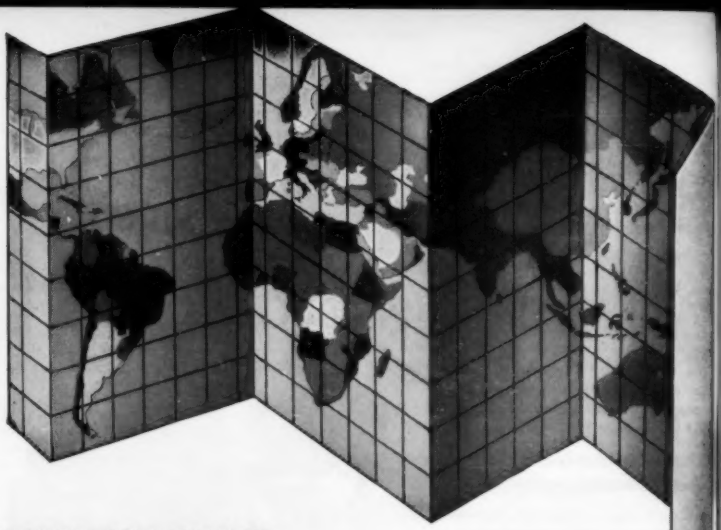

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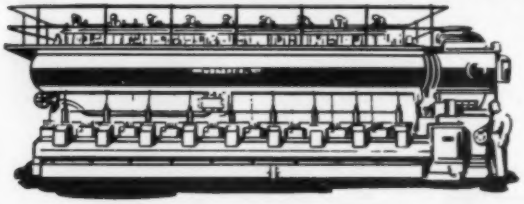

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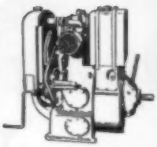

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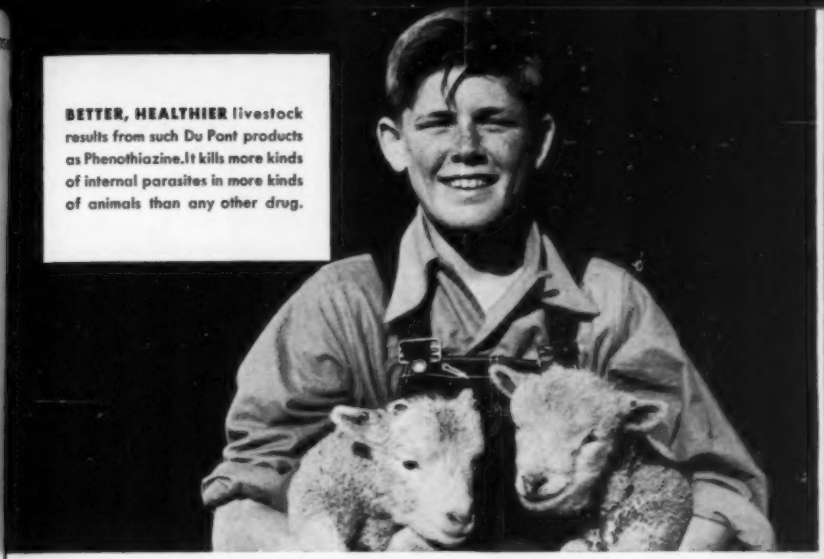
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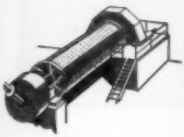

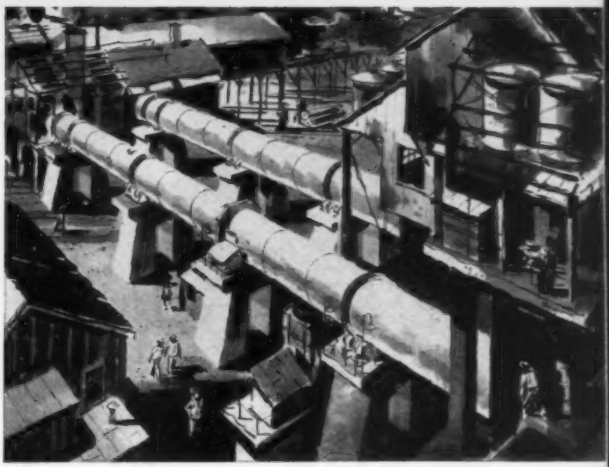

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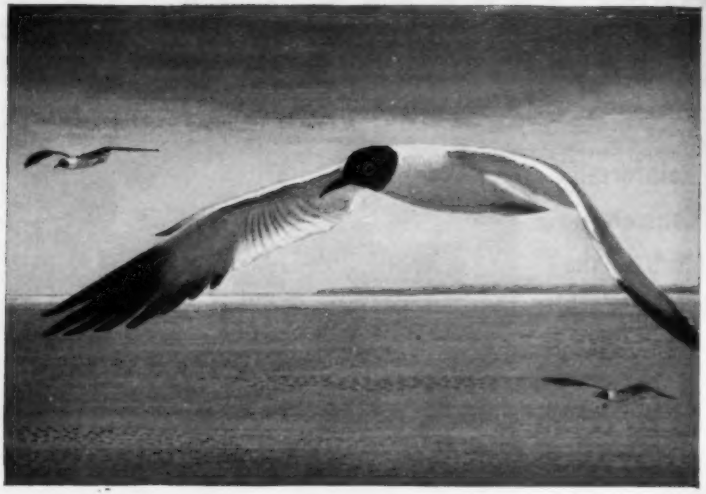

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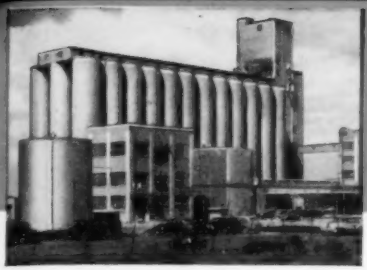

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